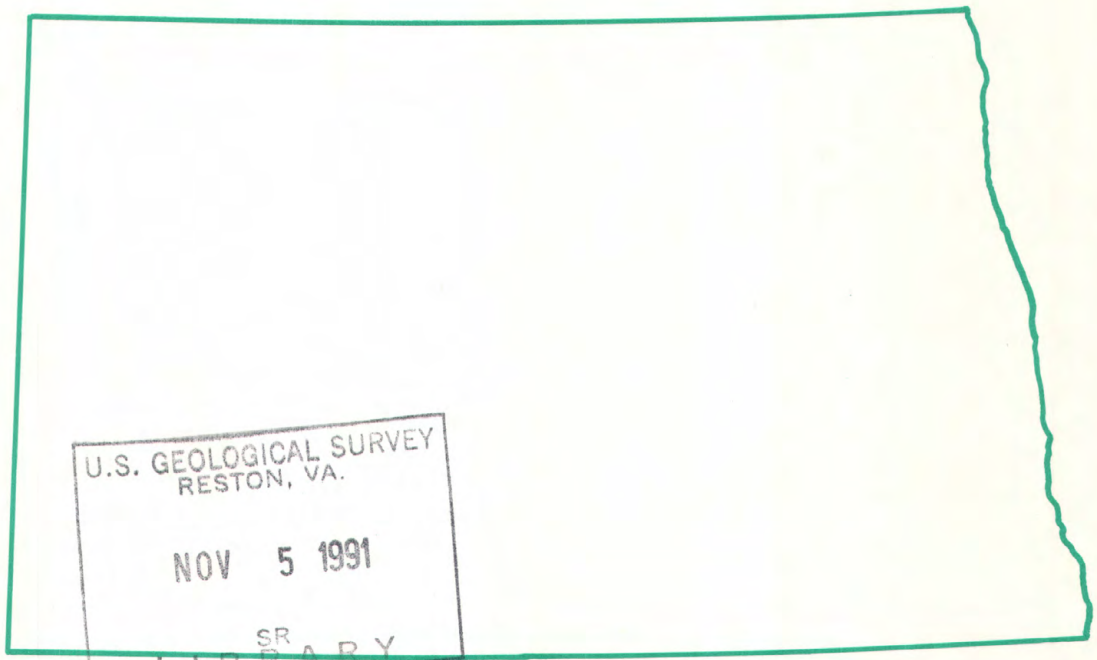
Water Resources Data North Dakota Water Year 1990



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-90-1
Prepared in cooperation with the State of North Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1990

1989

OCTOBER

S	M	T	W	T	F	S
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31						

1990

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JULY

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AUGUST

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SEPTEMBER

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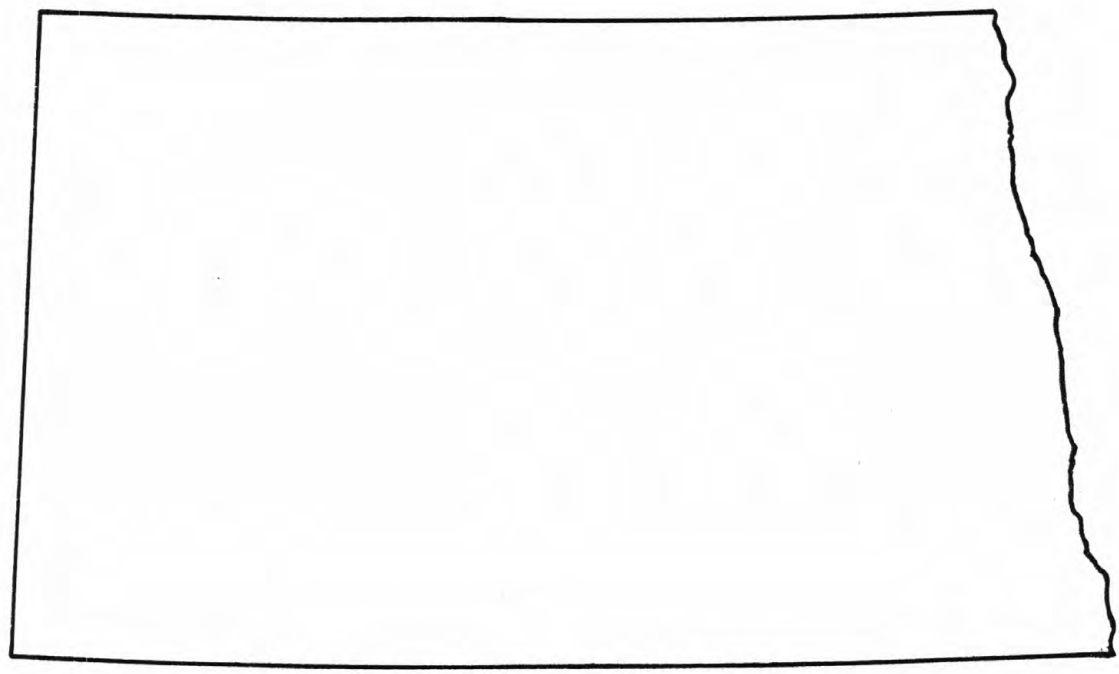
Water Resources Data North Dakota

Water Year 1990

by R.E. Harkness, N.D. Haffield and W.R. Berkas



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-90-1
Prepared in cooperation with the State of North Dakota
and with other agencies

DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., SECRETARY

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in North Dakota write to
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821 East Interstate Avenue
Bismarck, ND 58501-1199

1991

PREFACE

This volume of the annual hydrologic data report of North Dakota is one of a series of annual reports that documents hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of North Dakota and with other agencies under the supervision of William F. Horak, District Chief, North Dakota.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-91-247	2.	3. Recipient's Accession No.

4. Title and Subtitle
Water Resources Data, North Dakota, Water Year 1990

5. Report Date
Published April 1991

6.

7. Author(s)
R. E. Harkness, N. D. Haffield and W. R. Berkas

8. Performing Organization Rept. No.
USGS-WDR-ND-90-1

9. Performing Organization Name and Address
U.S. Geological Survey, Water Resources Division
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Bismarck, North Dakota 58501-1199

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Geological Survey, Water Resources Division
821 East Interstate Avenue
Bismarck, North Dakota 58501-1199

13. Type of Report & Period Covered
Annual - Oct. 1, 1989 to Sept. 30, 1990

14.

15. Supplementary Notes
Prepared in cooperation with the State of North Dakota and with other agencies.

16. Abstract (Limit: 200 words)

Water-resources data for the 1990 water year for North Dakota consist of records of discharge, stage, and water quality for streams; contents, stage, and water quality for lakes and reservoirs; and water levels and water quality for ground-water wells. This report contains records of water discharge for 104 streamflow-gaging stations; stage only for 22 river-stage stations; contents and/or stage for 13 lake or reservoir stations; annual maximum discharge for 8 crest-stage stations; water levels for 30 ground-water wells; and water quality for 87 streamflow-gaging stations, 4 river-stage stations, 7 lake or reservoir stations, 6 crest-stage stations, and 29 ground-water wells. Also included are discharge measurement data for 34 miscellaneous sites and water-quality data for 2 precipitation-chemistry stations. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in North Dakota.

17. Document Analysis a. Descriptors

*North Dakota, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses, Floods, Drought.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
No restriction on distribution. This report may be purchased from: National Technical Information Service, Springfield, VA 22161	Unclassified	362
	20. Security Class (This Page) Unclassified	22. Price

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ILLUSTRATIONS

TABLES

[Letter after station name designates type of data: (d) discharge, (e) elevation, gage height, or contents, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment, (r) radiochemical, (p) pesticides]

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED

GROUND-WATER LEVELS Page

GROUND-WATER LEVELS

QUALITY OF GROUND WATER

PRECIPITATION SITES, FOR WHICH CHEMICAL QUALITY DATA ARE PUBLISHED

WATER RESOURCES DATA - NORTH DAKOTA, 1990

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of North Dakota each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the U.S. Geological Survey, the data are published annually in this report series entitled "Water Resources Data - North Dakota."

This report series includes records of discharge, stage, and water quality for streams; contents, stage, and water quality for lakes and reservoirs; and water levels and water quality for ground-water wells. This volume contains records of water discharge for 104 streamflow-gaging stations; stage only for 22 river-stage stations; contents and/or stage for 13 lake or reservoir stations; annual maximum discharge for 8 crest-stage stations; water levels for 30 ground-water wells; and water quality for 87 streamflow-gaging stations, 4 river-stage stations, 7 lake or reservoir stations, 6 crest-stage stations, and 29 ground-water wells. Locations of these stations and wells are shown in figures 1, 2, and 3. Also included are discharge measurement data for miscellaneous sites (27 discharge measurements made by U.S. Geological Survey personnel for 6 miscellaneous sites and 129 discharge measurements made by North Dakota State Water Commission personnel for 19 miscellaneous sites). Data are included for 2 precipitation-chemistry stations. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in North Dakota.

This series of annual reports for North Dakota began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for North Dakota were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 5 and 6." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and ground-water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 810, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the U.S. Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example this volume is identified as "U.S. Geological Survey Water-Data Report ND-90-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephoning (701) 250-4604.

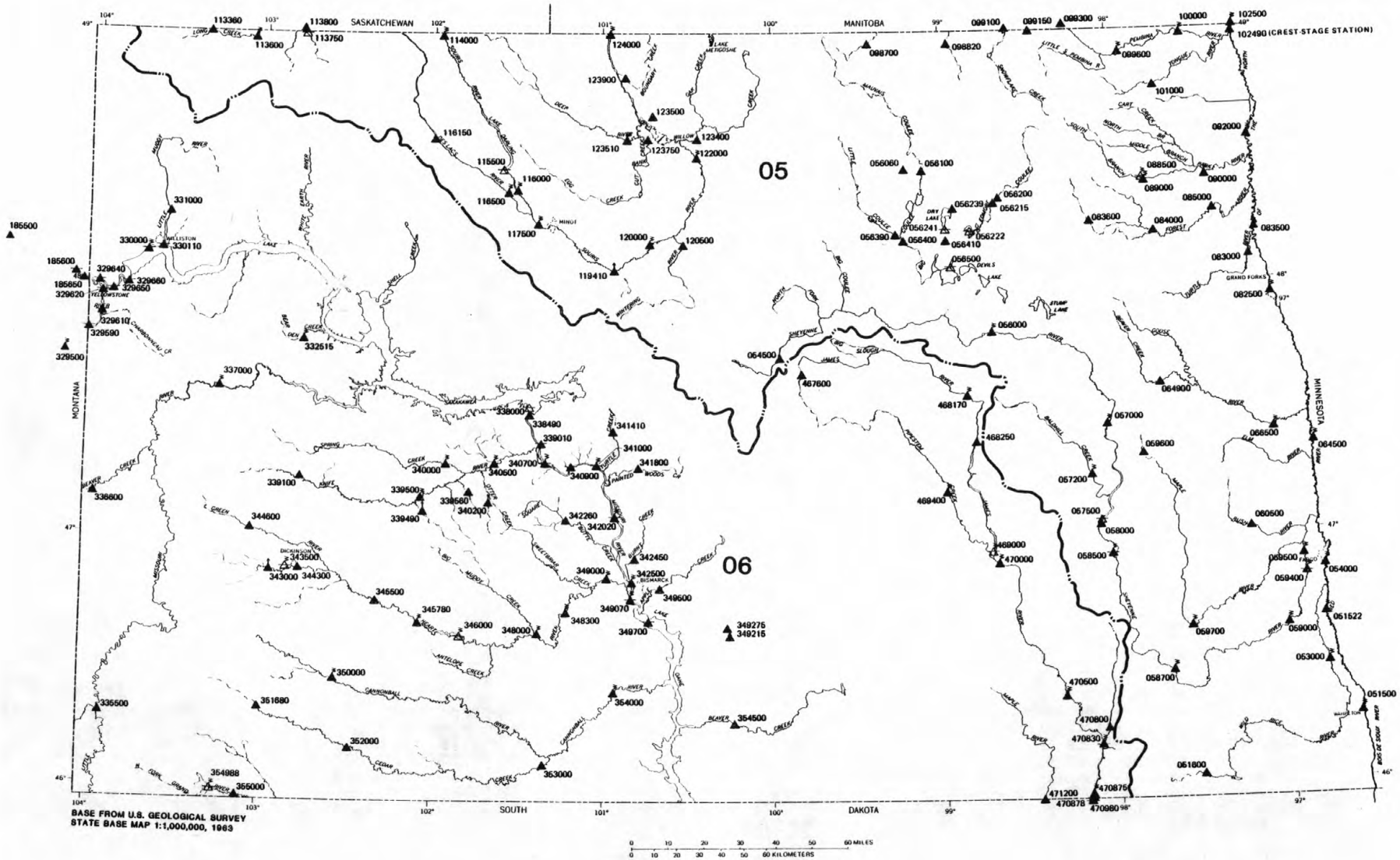
COOPERATION

The U.S. Geological Survey and agencies of the State of North Dakota have had cooperative agreements for the collection of streamflow records since 1903, ground-water levels since 1937, and water-quality records since 1946. Organizations that assisted in collecting the data in this report through cooperative agreement with the Survey are: North Dakota State Water Commission, David A. Sprynczynatyk, Chief Engineer; North Dakota Public Service Commission, Dale V. Sandstrom, President; Lower Heart River Water Resources District, W.S. Russell, Chairman; Oliver County Board of Commissioners, Donald Albers, Chairman; City of Minot, George M. Christensen, Mayor; City of Dickinson, R.B. Baird, Mayor.

Assistance with funds or services was given by the U.S. Army Corps of Engineers for 24 streamflow-gaging stations, 19 river-stage stations, 4 reservoir stations, 3 crest-stage stations, 34 ground-water wells, and water quality for 9 streamflow-gaging stations and 1 lake station; the U.S. Bureau of Reclamation for 3 streamflow-gaging stations, 1 river-stage station, 2 reservoir stations, and water quality for 9 streamflow-gaging stations and for 5 lake or reservoir stations; the U.S. Fish and Wildlife Service for 7 streamflow-gaging stations; the International Joint Commission of the U.S. State Department for 11 streamflow-gaging stations and 1 reservoir station; the U.S. Soil Conservation Service for 1 streamflow-gaging station and 1 crest-stage station; and other U.S. Department of the Interior agencies concerned with the Missouri River basin for 6 streamflow-gaging stations, 3 river-stage stations, 3 reservoir stations, and water quality for 8 streamflow-gaging, river-stage, or reservoir stations.

Certain stations are maintained under agreement with Canada and the records are obtained and compiled in a manner equally acceptable to both countries. Most of these are designated as "international gaging stations."

Organizations that provided data are acknowledged in station descriptions.



EXPLANATION

- ▲ Stream-gaging station
- ▲ Crest-stage station
- ▲ Telemetered stream station
- 058700 Abbreviated station number, complete number includes prefix "05" or "06".
- 05 Hudson Bay basin drainage
- 06 Missouri River basin drainage
- Drainage basin boundary
- ▲ Stream-stage station
- △ Lake-stage station
- △ Telemetered lake station

Figure 1.--Location of active surface-water gaging stations.

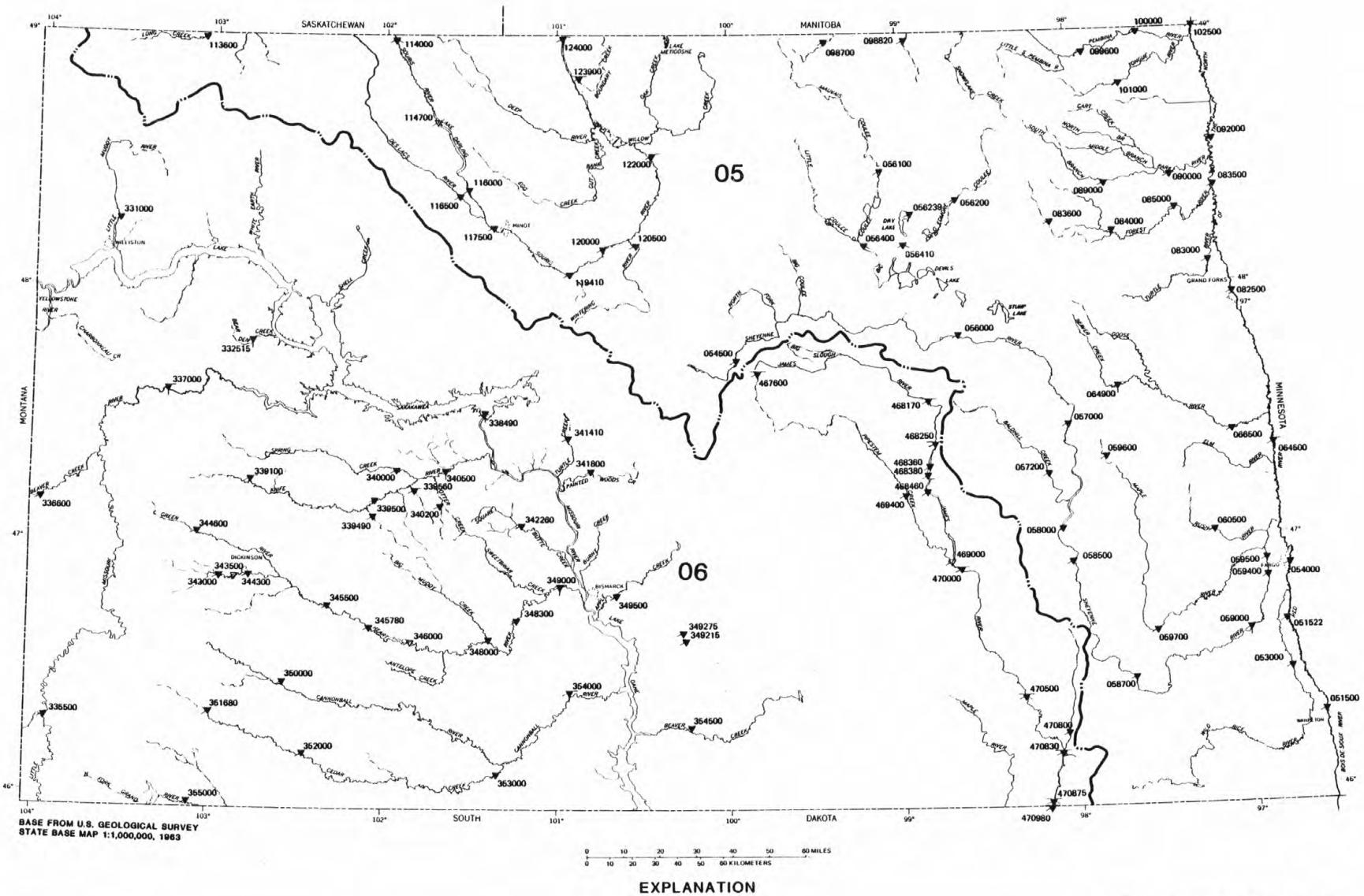


Figure 2.--Location of active surface-water-quality stations.

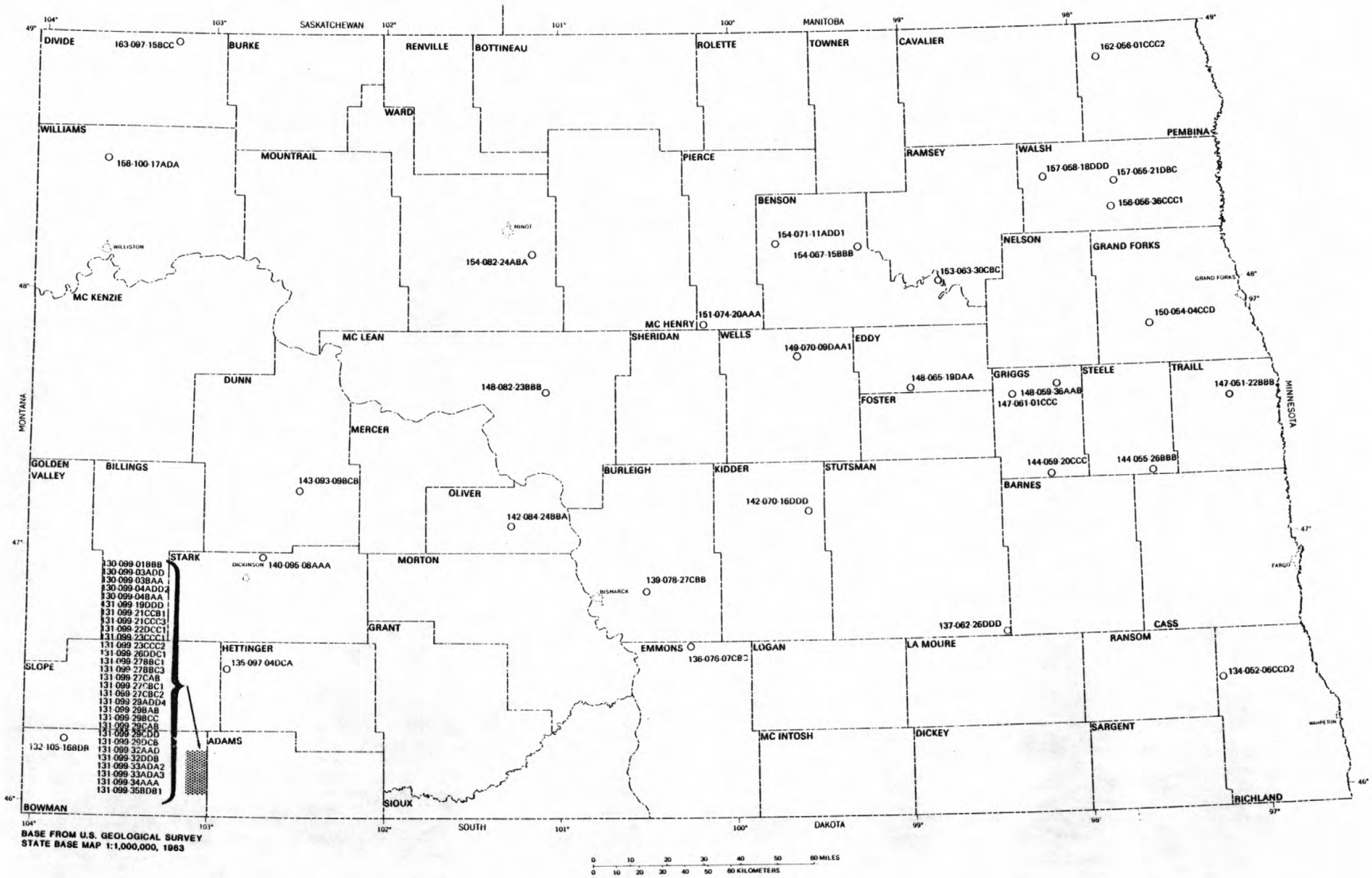


Figure 3.--Location of selected ground-water observation wells.

SUMMARY OF HYDROLOGIC CONDITIONS

Climate

In North Dakota, normal annual precipitation ranges from about 15 inches in the western part of the State to about 20 inches in the eastern part of the State. Three-fourths of this precipitation occurs during April through September. Greatest normal monthly precipitation for the entire State generally occurs during June. Normal, as used in reference to meteorological data in this report, is an average value for the reference period 1951 through 1980. Meteorological data were obtained from publications of the National Weather Service (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 1989, 1990, Climatological data, North Dakota: Asheville, North Carolina, v. 98, no. 10-12, v. 99, no. 1-9).

North Dakota is divided into nine National Weather Service climatological divisions (fig. 4). Precipitation during water year 1990 ranged from about 4 inches less than normal in the south-central division to near normal in the northwest and north-central divisions. The central division, with about 0.5 inch greater than normal precipitation for the year, was the only division that recorded greater than normal precipitation for the year.

A comparison of total monthly precipitation for water year 1990 to normal monthly precipitation for 1951-80 for the nine National Weather Service climatological divisions in North Dakota is shown in figure 4. The data displayed in figure 4 are simple averages of the total monthly precipitation for reporting stations within each climatological division.

Precipitation during the usually dry fall and winter months of October through February generally was much less than normal statewide, except for November when precipitation averaged near normal for the month. Precipitation during October averaged 0.6 inch statewide, or about 60 percent of normal. Precipitation during the months of December, January, and February averaged less than 0.2 inch for each month statewide, or less than 50 percent of normal. All of the nine climatological divisions had less than normal precipitation for the entire 3-month period. The National Weather Service characterized the period as the driest winter on record since records were started in 1895 (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, National Meteorological Center, Climate Analysis Center, 1990, Weekly Climate Bulletin, March 17, 1990, no. 90/11, p. 10).

Normal monthly precipitation during March is greater than that for the winter months of December through February. During March 1990, the eastern half of the State received greater than normal precipitation. Several weather stations in the eastern part of the State recorded more than 2 inches of precipitation. This precipitation, mostly in the form of snow, resulted from a storm in mid-March that deposited as much as 1 foot of snow in some areas. The graph of the total monthly precipitation for the northeast division (fig. 4) shows a sharp peak for March 1990 that is well above the dashed line representing the normal monthly precipitation. The graphs for several of the other divisions show similar, although less pronounced, peaks for March 1990. The southwest division, however, had as little as 0.3 inch of precipitation, or about 50 percent of normal.

Precipitation during April and May 1990 was either less than normal or near normal for the western parts of the State and generally decreased to less than normal during May in the eastern part of the State. Precipitation during June was much greater than normal except for the southwest and south-central divisions, where precipitation was slightly greater than normal, and the northwest division, where precipitation was slightly less than normal. In general maximum monthly precipitation in the State for the 1990 water year occurred during June. The northwest division was the only division where maximum monthly precipitation for the 1990 water year occurred during July.

Except for the northwest division the entire State had near normal or less than normal precipitation during July. In general, precipitation was less than normal through August and September. Statewide, precipitation averaged 0.5 inch less than normal for both months.

Average monthly temperatures across the State during water year 1990 were within about 3 °C (about 5 ?F) of normal, except during December, January and March. December temperatures were about 4 °C (about 7 °F) less than normal and March temperatures were about 4 °C (about 7 °F) greater than normal. However, January temperatures averaged more than 9 °C (about 16 °F) greater than normal. The North Dakota Agricultural Statistics Service (written commun., February 5, 1990) stated that "This January was the warmest on record at Fargo and was the 4th warmest at both Bismarck and Williston."

Because of the record dry winter and the record high January temperatures, very little snow remained on the ground anywhere in the State at the end of January. Similarly, the greater than normal March temperatures melted the snow that was deposited during mid-March and very little snow existed anywhere in the State by the end of March.

The Palmer Drought Severity Index on selected dates for the nine National Weather Service divisions in North Dakota is shown in table 1a, 1b, and 1c (M. T. Roletto, National Weather Service, written commun., 1989, 1990, and 1991). "The Palmer Drought Index is widely used as a measure of the severity of drought. Positive values indicate a moisture excess, values near zero indicate normal conditions, and values less than zero indicate drier than normal. An index of less than -3 is termed a severe drought, and an index of less than -4 is the worst condition, termed extreme drought." (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, U.S. drought 1988 -- A climate assessment: NOAA Climate Office, Rockville, MD, 1988, p. 2). Values for the 1988 water year are shown in table 1a, values for the 1989 water year are shown in table 1b, and values for the 1990 water year are shown in table 1c.

A comparison of values at the beginning of the three water years (see table 1a, 10/03/87; table 1b, 10/01/88; and table 1c, 10/07/89) shows that drought conditions were much more severe at the beginning of the 1989 and 1990 water years than at the beginning of the 1988 water year. The lowest Palmer Drought Severity Indexes recorded statewide during the 1988 water year (table 1a, 09/10/88) indicated much more severe conditions than for the most severe condition during the 1989 water year (table 1b, 08/05/89) or during the 1990 water year (table 1c, 09/29/90). Comparison of index values for 10/07/89 with those for 09/29/90 (table 1c) generally indicate that drought conditions became more severe by the end of the 1990 water year than they had been at the beginning of the water year.

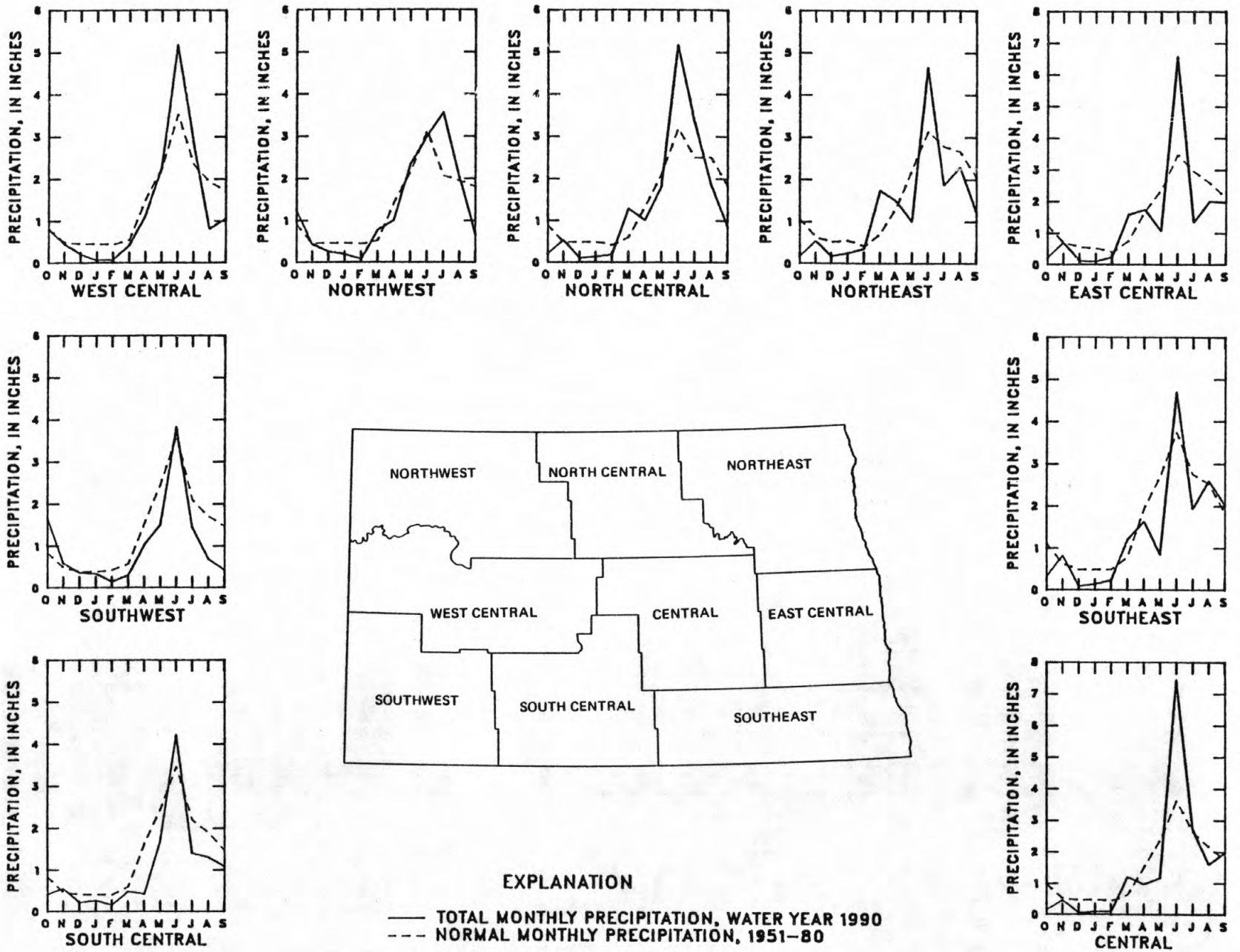


Figure 4.--Comparison, by climatological division, of total monthly precipitation, water year 1990, to normal monthly precipitation, 1951-80.

Table 1.--Palmer Drought Severity Index on selected dates for water years 1988, 1989, and 1990 for the nine National Weather Service climatological divisions in North Dakota (M. T. Roletto, National Weather Service, written commun., 1989, 1990, 1991)

[Below -4.0, extreme drought; -3.9 to -3.0, severe drought; -2.9 to -2.0, moderate drought; -1.9 to -1.0, mild drought; -0.9 to -0.5, incipient drought, -0.4 to +0.4, near normal; +0.5 to +0.9, incipient moist spell; +1.0 to +1.9, moist spell; +2.0 to +2.9, unusual moist spell; +3.0 to +3.9, very moist spell; +4.0 and above, extreme moist spell]

Table 1a.--Water year 1988

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/03/87	01/01/88	04/02/88	07/02/88	09/10/88
Northwest	+1.5	-2.7	-2.5	-5.6	-7.0
North central	+2.4	-1.6	-1.1	-4.2	-6.5
Northeast	+2.4	-1.2	+0.3	-4.2	-5.4
West central	+1.3	-1.8	-1.7	-5.3	-7.5
Central	+2.1	-1.4	-1.5	-4.5	-6.0
East central	+3.5	+1.9	+1.7	-3.8	-5.2
Southwest	+2.4	-1.2	-1.1	-4.1	-6.5
South central	+3.8	-1.4	-1.4	-4.3	-5.8
Southeast	-2.3	-2.4	-2.8	-6.3	-7.2

Table 1b.--Water year 1989

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/01/88	12/31/88	04/01/89	07/01/89	08/05/89
Northwest	-5.9	-4.2	-3.0	-3.3	-5.2
North central	-5.3	-3.4	-3.0	-2.2	-4.4
Northeast	-5.4	-4.5	-3.8	-3.6	-5.6
West central	-6.8	-5.4	-4.5	-4.7	-5.8
Central	-5.6	-4.4	-3.9	-5.1	-6.2
East central	-3.9	-2.8	-1.8	-3.2	-5.3
Southwest	-6.0	-4.5	-4.5	-4.4	-4.9
South central	-5.4	-3.6	-3.3	-4.2	-5.6
Southeast	-5.5	-3.6	-2.5	-3.4	-4.2

Table 1c.--Water year 1990

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/07/89	12/30/89	03/31/90	06/30/90	09/29/90
Northwest	-5.4	-3.1	-3.1	-3.8	-4.2
North central	-4.3	-4.3	-2.7	-0.7	-3.3
Northeast	-5.3	-5.4	-3.1	-2.4	-4.8
West central	-5.7	-4.1	-4.5	-3.7	-6.4
Central	-3.3	-3.2	-3.1	-2.9	-4.5
East central	-2.3	-3.3	-1.4	-1.4	-3.5
Southwest	-4.8	-2.8	-2.2	-2.4	-5.9
South central	-2.8	-3.3	-3.5	-3.6	-5.4
Southeast	-1.6	-3.0	-2.5	-3.8	-3.7

Streamflow

The largest mean monthly discharge of North Dakota rivers generally is coincident with snowmelt runoff. Because the springtime temperature gradient normally decreases from southwest to northeast, snowmelt usually begins on the Missouri River tributaries in western North Dakota and progresses from west to east across the State. Hydrographs of mean monthly discharge (fig. 5) for the period of record verify this trend. For example, the largest mean monthly discharge for Bear Den Creek near Mandaree, which is in the National Weather Service west-central division, normally occurs in March; whereas, the largest mean monthly discharge for the remaining streamflow-gaging stations normally occurs in April. Mean monthly discharge for March is almost as large as mean monthly discharge for April for Cedar Creek near Haynes and Beaver Creek at Linton, further substantiating the general trend of snowmelt progressing from west to east in North Dakota.

Although many inferences can be made about hydrologic conditions of the State by using precipitation data (fig. 4) and streamflow data (fig. 5), sound hydrologic judgment should be used. Variability of rainfall intensity and distribution should be considered when making conclusions about hydrologic response to rainfall, especially for small basins. Problems may occur because different reporting periods are used for the normal monthly precipitation data and the mean monthly discharge data in the two figures. Normal monthly precipitation is computed using a 30-year reference period from 1951 to 1980, but mean monthly discharges are computed using data for the period of record at each streamflow-gaging station--1967-90 (24 years), in the case of Bear Den Creek near Mandaree.

The precipitation graphs in figure 4 could lead one to believe that the 1990 water year would not be an unusually low runoff year statewide. However, the monthly mean discharges for all nine streamflow-gaging stations generally are significantly less than the period of record mean monthly discharges (fig. 5). The only significant exception is for the Rush River at Amenia for the month of June. Precipitation was almost double the normal amount for the east-central division during June. As a result, the mean discharge for the Rush River during June exceeded the mean monthly discharge for the period of record.

The Devils Lake basin is a 3,800 square-mile closed basin adjacent to the headwaters of the Sheyenne River. Less than normal runoff in the Devils Lake basin during water years 1988, 1989, and 1990 has resulted in declining water levels in Devils Lake. Since reaching a record high water level (of this century) of 1,428.89 feet above sea level on August 2, 1987, the water level in Devils Lake has fallen more than 5 feet, to an elevation of 1,423.75 feet, at the end of the 1990 water year.

To further substantiate the extreme deficiency in streamflow caused by the 1988-90 drought, selected streamflow statistics for the nine streamflow-gaging stations shown in figure 5 are summarized in table 2. Annual mean and peak discharges for water years 1988, 1989, and 1990 for each streamflow-gaging station are ranked against similar data for each year during the period of record. The lowest annual mean discharge for each streamflow-gaging station and the lowest annual peak discharge for each streamflow-gaging station are given a rating of 1.

Analysis of the rankings of means and peaks for water years 1988, 1989, and 1990 shows that the effect of the drought on streamflow for these nine streamflow-gaging stations was the most severe in 1988, less severe in 1990, and the least severe in 1989. An exception is the James River near Grace City where the annual mean discharges for the 3 years were three of the five lowest annual mean discharges for the 22 year period of record. Other notable exceptions include the Wintering River near Karlsruhe, the Park River at Grafton, and the Wild Rice River near Abercrombie where the effect of the drought on streamflow was more severe in 1990 than in the two previous water years. The continued drought appears to have severely affected the flow in the Park River at Grafton where both the mean and peak discharges for the 1990 water year were the lowest for the 59-year period of record (table 2). However, regulation at Homme Reservoir on the South Branch of the Park River and other influences of man probably also contributed to the record low values.

Chemical Quality of Streamflow

The chemical quality of streamflow at any particular site is dependent upon many factors, including source of streamflow, composition of rocks over which water flows, location, and time of year; therefore, the quality of streamflow varies considerably across the State. The chemical quality of streamflow also is dependent on the volume of streamflow. During periods of low flow, most of the flow is derived from ground-water inflow, which is mineralized, and the resulting streamflow has large dissolved-solids concentrations. During periods of high flow, most of the flow is derived from snowmelt or rainfall runoff, which is not mineralized, and the resulting streamflow has small dissolved-solids concentrations.

Five stations were selected from around the State to show the variability in stream water quality among the different river drainages. Specific conductance, an indicator of dissolved solids in water, is used to show the water-quality variability among these stations and among months at a given station. The mean, maximum, and minimum specific conductance for the period of record and the specific conductances measured during the 1990 water year for each station are shown in table 3.

Specific conductance is used as an indicator of the suitability of water for irrigation and other uses. The U.S. Salinity Laboratory (U.S. Salinity Laboratory Staff, 1954, Diagnosis and improvement of saline and alkali soils: U.S. Department of Agriculture Handbook 60, 160 p.) has developed an index using specific conductance as an indicator of salinity hazard for irrigation water. The salinity hazard and corresponding specific conductance are as follow:

Salinity hazard	Specific conductance (microsiemens per centimeter at 25 °C)
Low	less than 250
Medium	250 - 750
High	750 - 2,250
Very high	2,250 - 5,000

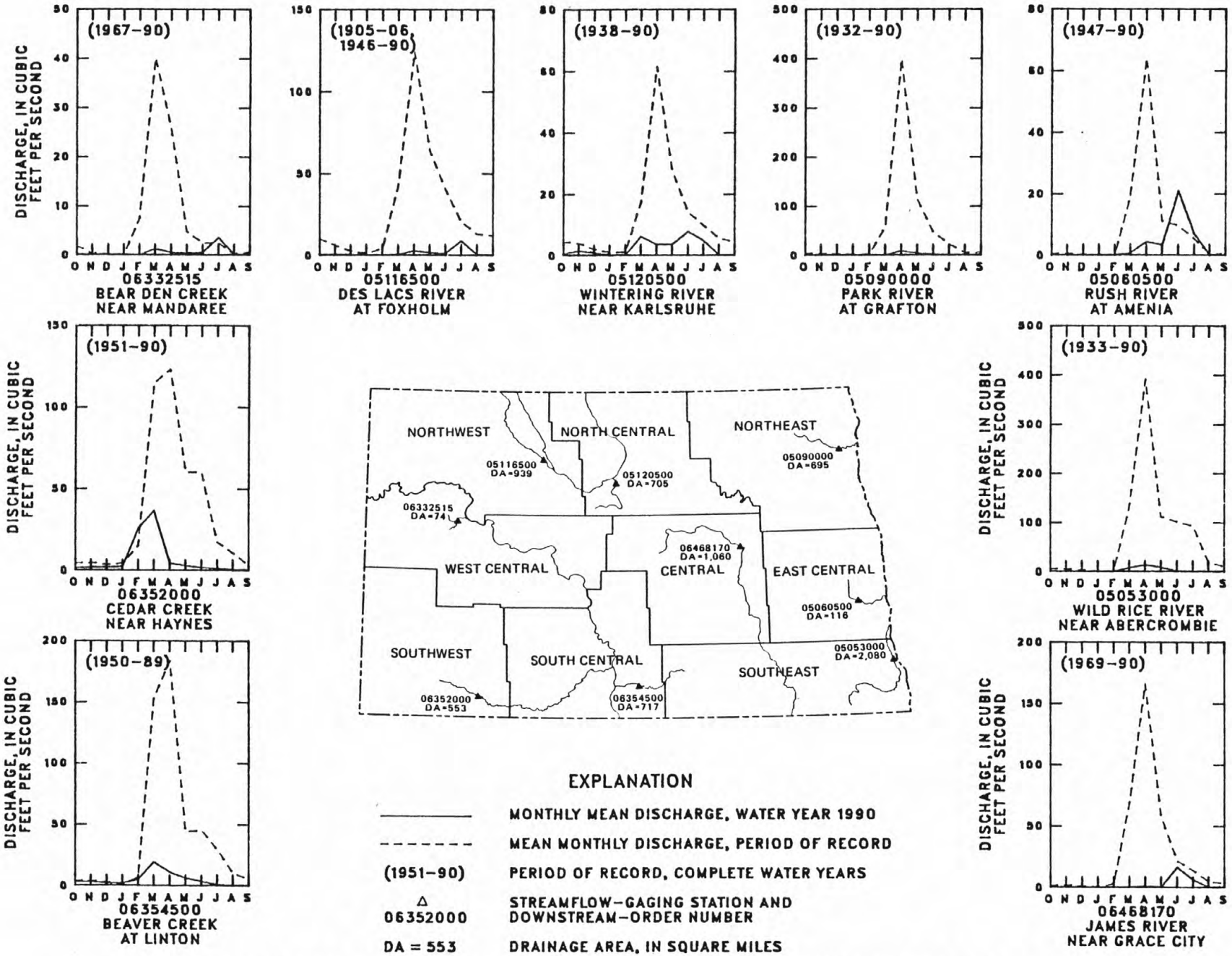


Figure 5.--Comparison of monthly mean discharge during water year 1990 to mean monthly discharge for the period of record.

Table 2.--Period-of-record mean annual and median annual discharges; water years 1988, 1989, and 1990 mean and peak discharges; and ranking of water years 1988, 1989, and 1990 data versus record low mean and low peak discharges for period of record at selected streamflow-gaging stations

[ft^3/s, cubic feet per second]

Streamflow-gaging station	Period of record			Mean discharge (ft^3/s)			Ranking of mean from lowest annual mean discharge for period of record			Peak discharge (ft^3/s)			Ranking of peak from lowest annual peak discharge for period of record		
	Number of years	Mean annual discharge (ft^3/s)	Median annual discharge (ft^3/s)	1988	1989	1990	1988	1989	1990	1988	1989	1990	1988	1989	1990
Beaver Creek at Linton	40	41.0	28	4.54	28.3	4.76	2	22	3	39	4,450	59	1	35	2
Cedar Creek near Haynes	40	35.2	28	3.98	9.99	6.77	3	11	7	28	591	110	1	15	4
Bear Den Creek near Mandaree	24	7.21	6.7	.27	2.25	.61	1	9	3	12	375	190	2	10	6
Des Lacs River at Foxholm	47	28.4	1	.93	9.34	1.48	2	16	4	4.2	240	129	1	13	8
Wintering River near Karlsruhe	53	12.7	11	3.31	3.69	2.45	11	13	5	64	120	41	16	24	12
Park River at Grafton	59	55.2	40	5.13	3.96	1.38	9	7	1	143	143	24	6	6	1
Rush River at Amenia	44	9.32	6.2	1.13	9.16	3.04	4	27	12	30	602	64	3	33	6
Wild Rice River near Abercrombie	58	72.7	36	3.99	158	2.70	4	50	2	105	7,150	74	7	57	4
James River near Grace City	22	28.7	19	5.01	1.29	2.11	5	3	4	150	100	294	5	4	9

Table 3.--Statistical summary of specific-conductance measurements for the period of record and listing of specific-conductance measurements for water year 1990.

[Specific-conductance values are in microsiemens per centimeter at 25 °Celsius; --, indicates no data]

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Water year 1990	Period of record
05082500 Red River of the North at Grand Forks (period of record, water years 1949, 1956-90)														
Mean	516	587	619	589	567	489	459	558	546	499	506	493	654	522
Maximum	700	790	*985	*1,040	*865	910	747	702	699	640	625	674	1,040	*1,040
Minimum	399	440	468	275	400	305	200	325	348	280	360	340	462	200
Number of values	65	36	46	45	41	72	153	86	72	71	53	45	12	785
Measured values for water year 1990	500	--	*985	*1,040	*865	--	462 495 510	565	575	608	625	623	--	--
05114000 Souris River near Sherwood (period of record, water years 1970, 1972-90)														
Mean	1,200	1,300	1,630	1,740	1,630	1,200	620	787	1,020	1,040	1,000	1,060	1,290	1,130
Maximum	*2,240	*2,160	2,230	2,770	2,200	2,180	1,280	1,160	1,340	1,420	*1,700	1,240	2,240	2,770
Minimum	710	925	1,250	1,280	540	200	277	345	520	540	128	755	380	128
Number of values	30	24	14	21	21	31	44	21	26	22	27	16	14	297
Measured values for water year 1990	1,680 *2,240 2,210 2,070	*2,160	--	--	--	565 580	380 540 715	860	1,030	1,370	*1,700	--	--	--
06337000 Little Missouri River near Watford City (period of record, water years 1972-90)														
Mean	2,030	2,020	2,880	2,400	1,220	970	1,440	1,730	1,610	1,780	1,720	1,770	1,650	1,730
Maximum	3,100	2,610	5,000	3,350	2,030	1,760	2,700	3,100	2,780	3,000	2,520	2,390	2,720	5,000
Minimum	720	740	1,730	1,500	640	400	515	780	*750	1,080	*682	900	682	400
Number of values	18	15	10	8	5	22	20	16	20	15	19	13	9	181
Measured values for water year 1990	2,500 2,500	--	2,720	--	--	820	1,630	--	*750 1,240	--	*682	2,000	--	--
06354000 Cannonball River at Breien (period of record, water years 1950, 1971-90)														
Mean	1,670	2,160	2,570	2,460	1,930	858	1,130	1,800	1,650	1,580	1,460	1,640	1,470	1,660
Maximum	2,400	3,070	3,290	3,800	4,860	3,100	2,260	2,930	3,020	3,000	2,800	2,300	3,550	4,860
Minimum	903	1600	284	680	190	190	300	481	610	570	*500	730	500	190
Number of values	20	20	18	24	25	39	36	22	21	20	20	21	12	286
Measured values for water year 1990	--	1,620 2,450	--	3,550	1,040	1,120 760 830	1,180	1,630	1,300	--	*500	1,670	--	--
06470500 James River at LaMoure (period of record, water years 1957-90)														
Mean	840	916	1,150	1,430	1,340	618	519	800	807	794	779	870	1,230	859
Maximum	1,130	*1,300	1,550	*2,160	1,720	1,350	919	1,210	1,180	1,280	1,140	1,210	2,160	*2,160
Minimum	480	540	890	340	700	185	160	500	170	170	485	480	710	160
Number of values	31	19	11	28	15	32	40	25	26	20	22	27	8	296
Measured values for water year 1990	930	*1,300	--	*2,160	1,650	710	--	960	--	1,040	1,120	--	--	--

* - New extreme value, maximum or minimum, occurred during 1990.

The Red River of the North drains eastern North Dakota and western Minnesota. Water from the Red River of the North at Grand Forks had the smallest specific conductance of the five stations listed in table 3 for most months. This is partly due to more precipitation occurring in the Red River of the North basin than in other parts of North Dakota. Drought conditions, which continued from the 1989 water year into the 1990 water year, resulted in new maximum monthly values for measured specific conductance for December, January, and February. Specific conductances decreased during snowmelt runoff in early April and remained near 600 microsiemens per centimeter through the rest of the water year. The salinity hazard of stream water for irrigation use was high in December, January, and February and medium in the other months where measurements were available.

The Souris River drains south-central Canada. Water from the Souris River near Sherwood had larger specific conductance than water from the Red River of the North, but smaller specific conductance than water from the Little Missouri River and the Cannonball River except for August when the Souris River had a maximum value for the month of August. The continued drought also resulted in new maximum monthly values for measured specific conductance for October and November. In the 1990 water year, the lowest specific conductance values measured occurred during the snowmelt runoff period in March and April. The salinity hazard of stream water for irrigation use was medium during March and April and high during the other months where measurements were available.

The Little Missouri River drains southwestern North Dakota and southeastern Montana. Water from the Little Missouri River near Watford City generally had the largest specific conductance values of the five stations listed in table 3. Large specific conductances were measured during low flow in the fall, winter, and summer. Small specific conductances were measured during snowmelt runoff in the spring and during rainfall runoff in the summer. New minimum monthly specific conductances for June and August were measured in 1990. The salinity hazard of stream water for irrigation use was very high in October and December, high in March, April, June, and September, and medium in August.

The Cannonball River drains southwestern North Dakota. Measured specific conductances were large during low-flow conditions, and small during snowmelt runoff in March and during rainfall runoff in August. The specific conductance measured in August was a new minimum monthly value for August. The salinity hazard of stream water for irrigation use was very high in January and high for the rest of the year, except for August when the salinity hazard was medium.

The James River drains central North Dakota. A number of reservoirs control the flow in the James River basin. These reservoirs are filled by snowmelt runoff, so releases from the reservoirs during the summer typically have specific conductances similar to those measured during periods of snowmelt runoff. Water from the James River at LaMoure generally has smaller specific conductance than water from the Little Missouri and Cannonball Rivers, but larger specific conductance than the water in the Red River of the North. Drought conditions in 1989 caused a new maximum monthly specific conductance for November and January. Large specific conductances were measured during low flow, and small specific conductances were measured during snowmelt runoff in March. The salinity hazard of stream water for irrigation use was high throughout the year except during snowmelt runoff in March when the salinity hazard was medium.

Ground-Water Levels

Water levels measured during water years 1987, 1988, 1989, and 1990 for well 134-052-06CCD2 completed in the Sheyenne Delta aquifer in Richland County are shown in figure 6. Water levels measured during the same period for well 140-095-08AAA completed in the Sentinel Butte aquifer in Stark County are shown in figure 7. The highest monthly water level, the mean of monthly water levels, and the lowest monthly water level for each of the two wells for the period of record prior to water year 1988 also are shown. Water-level fluctuations in both wells (figs. 6 and 7) appear to follow the typical pattern of rises during the wet spring months and declines during the rest of the year for all 4 water years.

The Richland County well is located in an area of no significant ground-water withdrawals (D. P. Ripley, North Dakota State Water Commission, oral commun., 1990), fluctuations in the water level mainly are a result of natural climatic conditions. Water levels in the Richland County well were near normal (fig. 6) until June 1987. However, lack of precipitation, especially during April and June 1987, probably caused the near record low water levels by the end of the 1987 water year. Lack of precipitation and the ensuing drought conditions during the spring of 1988 resulted in very little recovery in water level. From April 1988 through February 1989 new record low monthly water levels were measured.

The Richland County well is in the southeast corner of the State where flooding occurred during April of 1989. The water-level recovery from the all-time record low set in February 1989 was greater than 3 feet, but as the drought continued, water levels again fell to near record lows by the end of the 1989 water year. The continued drought conditions in the 1990 water year resulted in monthly water levels similar to those measured during the 1988 water year. A continuation of the drought, in the absence of a recharge event similar to the April 1989 flood, will almost certainly result in a number of record low water levels during the next water year.

Water from the Sentinel Butte aquifer generally is used for livestock watering and domestic supplies (Henry Trapp, Jr., and M. G. Croft, 1975, Geology and ground-water resources of Hettinger and Stark Counties, North Dakota: North Dakota State Water Commission, County Ground-Water Studies 16, Part I, 51 p.). Generally low yield and large dissolved-solids concentration of the water make the Sentinel Butte aquifer unsuitable for irrigation. Thus, changes in water levels in the Stark County well generally reflect natural climatic conditions rather than pumping-induced stresses.

Water levels in the Stark County well remained above or near normal through March of 1988 (fig. 7). The extreme deficiency in precipitation in April 1988, when most locations in the southwest division reported either no precipitation or only a trace for the month (normal precipitation for April in the southwest division is 1.5 inches), contributed to the rapid decline in water levels from April through September 1988. In the southwest division during April through September 1988, each month had less than normal precipitation. The total precipitation for April through September 1988 was about 6.5 inches, or only 50 percent of normal. The continued drought conditions resulted in record low or near record low water levels from September 1988 through February 1989. Although the water levels increased from March through June 1989, they remained more than a foot below normal and declined to a new record low for the month of September at the end of the 1989 water year.

Although the precipitation in the southwest division during October 1989 was much greater than normal, it had little apparent effect on the water levels in the Stark County well other than perhaps temporarily slowing the decline in the water levels. Precipitation in the division was near normal during November and December. Beginning in January, precipitation was less than normal and averaged only 60 percent of normal for the first 5 months of 1990. Very little, if any, normal spring-time recovery of the water levels occurred in the well. Although June precipitation averaged slightly greater than normal in the division, precipitation during the last 3 months of the water year only averaged 50 percent of normal. During the 1990 water year, 9 of the 12 monthly water-level measurements were new record low values. The 1990 water year closed out with an all-time record low water level for the 23-year period of record.

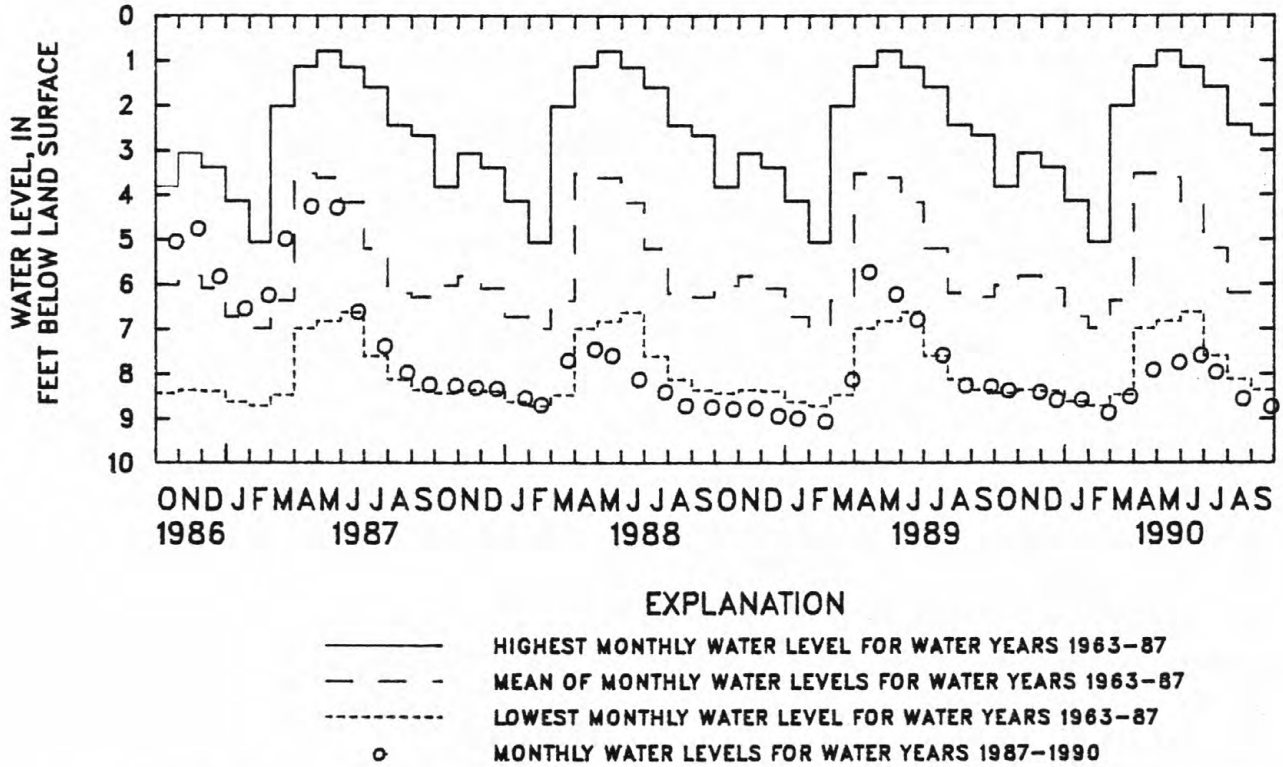


Figure 6.--Water levels for well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County.

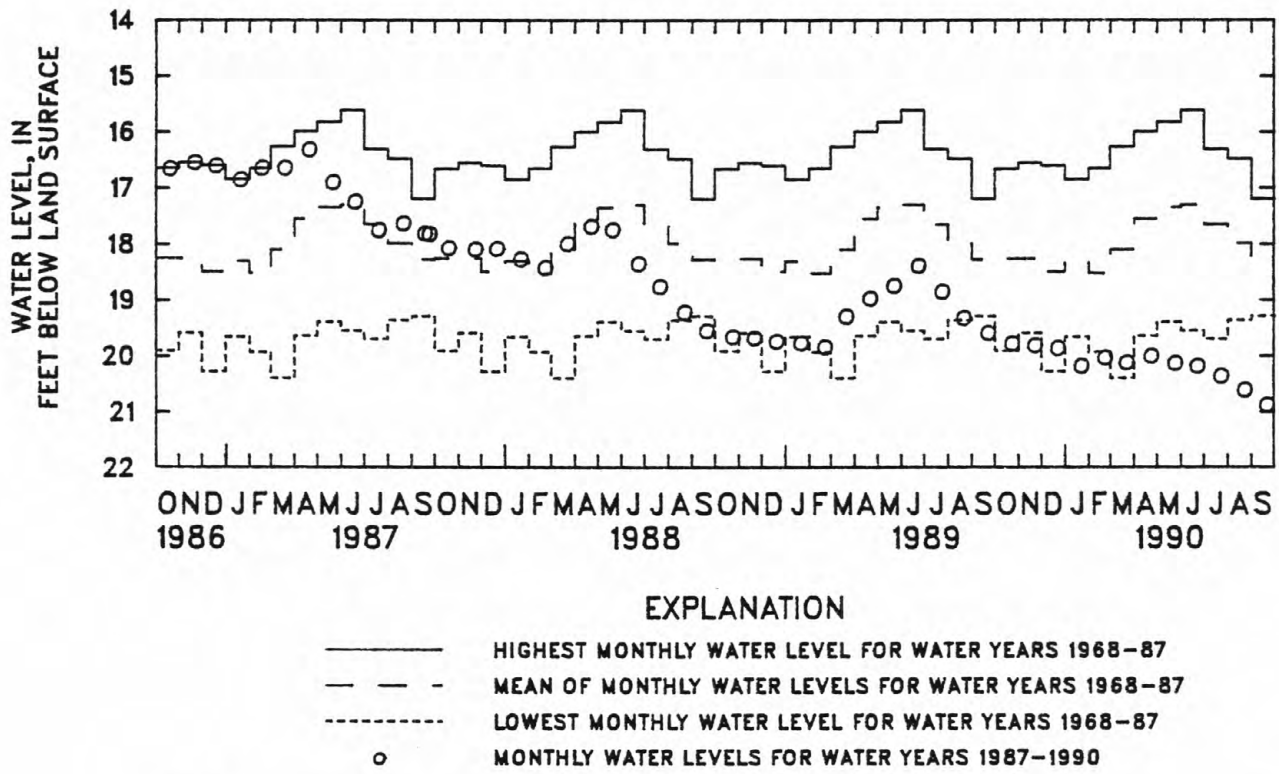


Figure 7.--Water levels for well 140-095-08AAA completed in Sentinel Butte aquifer, Stark County.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The 500 or so sites in NASQAN generally are located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting, (2) to aid in the description of the areal variability of water quality in the Nation's rivers, (3) to detect changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) to provide a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1990 water year that began October 1, 1989, and ended September 30, 1990. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 1, 2, and 3. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether stream site or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in North Dakota, for water-quality stations where streamflow or water level are not collected on a regular basis.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention shows which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 06342500, which appears just to the left of the station name, includes the two-digit part number "06" plus the six-digit downstream-order number "342500." The part number designates the major river basin; for example, part "06" is the Missouri River basin.

Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description (see fig. 8).

Local Well Numbers

In order to compare data for wells in other publications in North Dakota, such as the county ground-water studies, the wells in this report also are numbered according to a system based on the location in the public-land classification of the U.S. Bureau of Land Management. The system is illustrated in figure 9. The first number denotes the township north of a base line, the second number denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre tract). For example, well 139-049-15ADC is in the $SW^1/_4NE^1/_4SW^1/_4$ sec. 15, T. 139 N., R. 049 W. Consecutive terminal numbers are added if more than one well is recorded within a 10-acre tract.

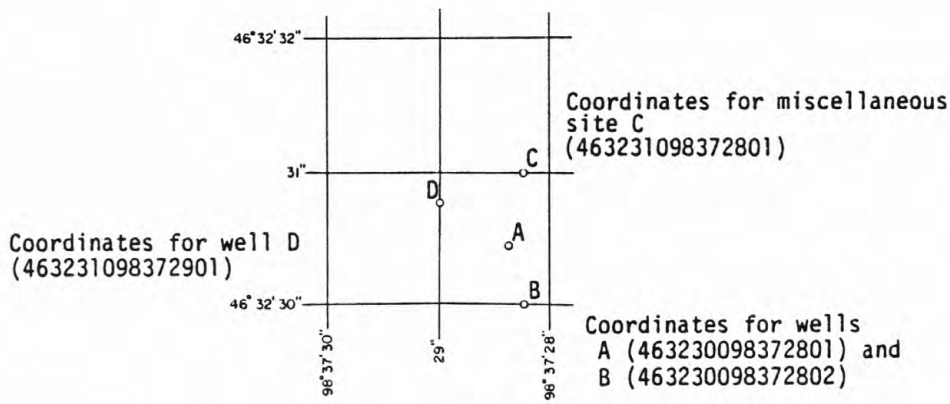


Figure 8.--System for numbering wells and miscellaneous sites (latitude and longitude).

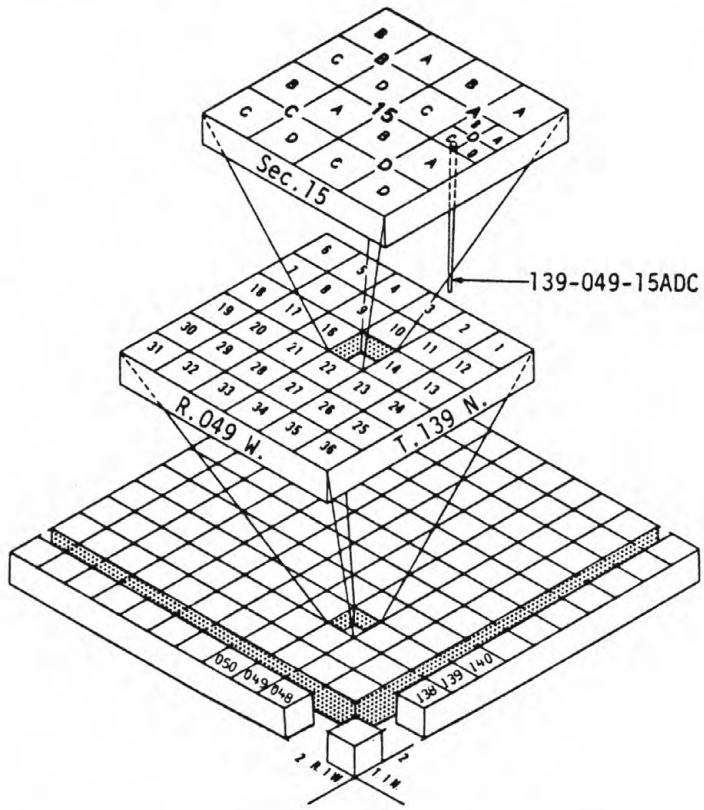


Figure 9.--System for numbering wells and miscellaneous sites (township and range).

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records. Locations of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figure 1.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage, with digital recorders that punch stage values on paper tapes at selected time intervals, with electronic data loggers that store data on an electronic chip, or with satellite data platforms that store data electronically and transmit the data periodically via satellite to a computer based data processing facility. Measurements of discharge are made with current meters using methods adopted by the U.S. Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow over dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. 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 the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used, if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

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 from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development. The median of yearly mean discharges also is given under this heading for stations having 10 or more water years of record, if the median differs from the average given by more than 10 percent.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the offices whose addresses are given on the back of the title page of this report to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually expressed in acre-feet (line headed "AC-FT"). In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years.

Data for crest-stage stations and measurements at miscellaneous sites are presented in two tables following the information for continuous-record sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e-Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 cubic foot per second; to the nearest tenth between 1.0 and 10 cubic feet per second; to whole numbers between 10 and 1,000 cubic feet per second; and to three significant figures for more than 1,000 cubic feet per second. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables is on file in the North Dakota District office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. An example of a computer listing of annual peak discharges for the Knife River at Hazen, N.Dak., gaging station (06340500) is shown in figure 10. An example of the computer generated Log-Pearson Type III annual peak-flow frequency analysis for these data, following the U.S. Water Resources Council guidelines in Bulletin 17B, is shown in tabular form by figure 11 and shown graphically by figure 12.

Usually data users are interested in comparing current streamflow to long-term averages. Examples of statistics computed for monthly mean discharges for the Knife River at Hazen are shown in figures 13 and 14.

Current flow data at U.S. Geological Survey gaging stations are available upon request, usually within less than one month following retrieval of the recorded data from the field site. After primary analysis the data are available in a computer format that shows hourly water level fluctuations, adjustments required for accurate computation of daily flows, and other details of the record analysis (see fig. 15). In this "primary computation" form, the data are considered provisional and subject to revision until published.

Many other statistics and data formats are available upon request. The information generally is available on a timely basis at no charge to the user; however, large requests or those specifically tailored to individual data-user's needs may be provided at a nominal fee. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the office whose address is given on the back of the title page of this report.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing record station is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records," as used in this report, and "continuous recordings," which refers to a continuous graph, a series of discrete values punched at short intervals on a paper tape, or electronically stored data from a data logger or satellite data platform. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 2.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence.

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, specific conductance, pH, and dissolved oxygen, need to be made on-site when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" which appears at the end of the introductory text. Also, detailed information on collecting, treating, and shipping samples may be obtained from the U.S. Geological Survey North Dakota District office.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

AGENCY: USGS
STATE: 38
COUNTY: 057
DISTRICT: 38

STATION LOCATOR
LAT. LONG.
471706 1013726

DRAINAGE AREA: 2240.00 SQ MI
CONTRIBUTING DRAINAGE 2240.00 SQ MI
GAGE DATUM: 1712.35 (NGVD)
BASE DISCHARGE: 1500.00 CFS

WATER YEAR	DATE	PEAK DISCHARGE (CFS)	DISC CODES	GAGE HEIGHT (FT)	GH CODES	MAX GAGE HEIGHT (FT)	DATE	GH CODES
1930	02/21/30	3070.00		23.20	1			
1931	09/22/31	1450.00		11.60				
1932	06/14/32	1300.00		11.10				
1933	03/17/33	2200.00		14.50				
1938	07/05/38	7540.00		23.00				
1939	03/24/39	9300.00		24.47				
1940	07/29/40	1150.00		10.92				
1941	06/09/41	4110.00		20.23				
1942	06/07/42	3120.00		17.10				
1943	03/26/43	26500.00		26.30				
1944	04/03/44	8010.00		23.39				
1945	03/15/45	8690.00		23.99				
1946	03/03/46	3500.00		19.30	1			
1947	06/25/47	6000.00		21.70	2	21.95	03/25/47	1
1948	03/24/48	7070.00		23.62	1			
1949	04/06/49	7760.00		23.30	2	24.10	04/03/49	1
1950	04/17/50	22700.00		25.93				
1951	03/30/51	9000.00		25.36	1			
1952	04/07/52	20200.00		25.83				
1953	06/14/53	3440.00		17.31				
1954	04/08/54	3880.00		18.06				
1955	03/13/55	1400.00	2	11.35				
1956	03/21/56	6630.00		23.76	1			
1957	03/01/57	1590.00		12.49	1			
1958	03/28/58	3500.00	2	19.82	1			
1959	03/24/59	4930.00		20.14				
1960	03/27/60	7230.00		23.13	1			
1961	03/03/61	488.00		9.62	12	9.72	03/02/61	1
1962	05/31/62	3860.00		17.48				
1963	06/10/63	1050.00		9.63				
1964	06/18/64	5170.00		20.17				
1965	04/15/65	3330.00		15.99				
1966	06/24/66	35300.00		27.01				
1967	03/25/67	7980.00		23.88				
1968	03/06/68	1800.00		18.37	1			
1969	04/07/69	11800.00		24.75				
1970	05/11/70	8180.00		23.83				
1971	03/17/71	4320.00		18.79	1			
1972	03/15/72	19000.00		26.17	1			
1973	03/02/73	3900.00		21.44	1			
1974	03/03/74	1350.00		14.28	1			
1975	05/01/75	6600.00		22.60	2	23.37	04/24/75	1
1976	03/19/76	3000.00		18.00	1			
1977	06/19/77	1200.00		9.75	2	11.69	03/11/77	1
1978	03/27/78	11000.00		25.10	1			
1979	04/18/79	5440.00		20.26				
1980	06/15/80	1620.00		10.58				
1981	02/18/81	900.00		9.92	1			
1982	03/31/82	10500.00		25.14	1			
1983	03/13/83	5300.00		23.00	1			
1984	03/21/84	2500.00		14.50	1			
1985	05/13/85	1540.00		10.10				
1986	03/04/86	8800.00		24.00				
1987	03/23/87	8550.00		23.80				
1988	03/24/88	450.00		7.47	1			
1989	03/11/89	1000.00		11.90				
1990	08/25/90	1940.00		10.84				

Figure 10.--Example of computer printout of annual peak discharges for the period of record on the Knife River at Hazen

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 2/20/91 AT 1731 SEQ 1.0001

OPTIONS IN EFFECT -- PLOT BCPU LGPT NODB PPOS NORS EXPR CLIM

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1990 06340500 /USGS

INPUT DATA SUMMARY

-- YEARS OF RECORD -- SYSTEMATIC	HISTORIC	HISTORIC PEAKS	GENERALIZED SKEW	STD. ERROR OF GENERAL. SKEW	SKEW OPTION	GAGE BASE DISCHARGE	USER-SET OUTLIER CRITERIA HIGH OUTLIER	LOW OUTLIER
57	0	0	-0.400	--	WRC WEIGHTED	0.0	--	--

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION. 256.4
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 64755.0

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE DISCHARGE	FLOOD BASE EXCEEDANCE PROBABILITY	LOGARITHMIC MEAN	LOGARITHMIC STANDARD DEVIATION	LOGARITHMIC SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.6101	0.4263	-0.096
W R C ESTIMATE	0.0	1.0000	3.6101	0.4263	-0.170

ANNUAL FREQUENCY CURVE ORDINATES -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	W R C ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR W R C ESTIMATES LOWER	UPPER
0.9950	278.1	297.6	236.1	161.1	420.3
0.9900	367.8	387.6	326.0	223.1	538.0
0.9500	774.4	789.8	737.9	528.0	1046.1
0.9000	1139.4	1147.2	1099.4	820.5	1485.4
0.8000	1800.2	1792.6	1769.1	1370.3	2271.1
0.5000	4189.2	4139.2	4189.2	3375.8	5205.7
0.2000	9373.5	9347.2	9519.5	7422.9	12335.3
0.1000	14061.0	14183.2	14492.6	10817.2	19433.8
0.0400	21419.9	21979.2	22494.8	15858.4	31410.3
0.0200	27937.5	29062.8	30019.5	20130.3	42651.6
0.0100	35330.7	37275.6	38706.8	24821.1	55968.5
0.0050	43649.5	46717.0	49218.0	29948.9	71546.3
0.0020	56151.8	61262.7	64219.0	37425.8	95936.6

Figure 11.--Example of computer printout for annual peak flow frequency analysis for the Knife River at Hazen.

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 2/20/91 AT 1731 SEQ 1.0001

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1990 06340500 /USGS

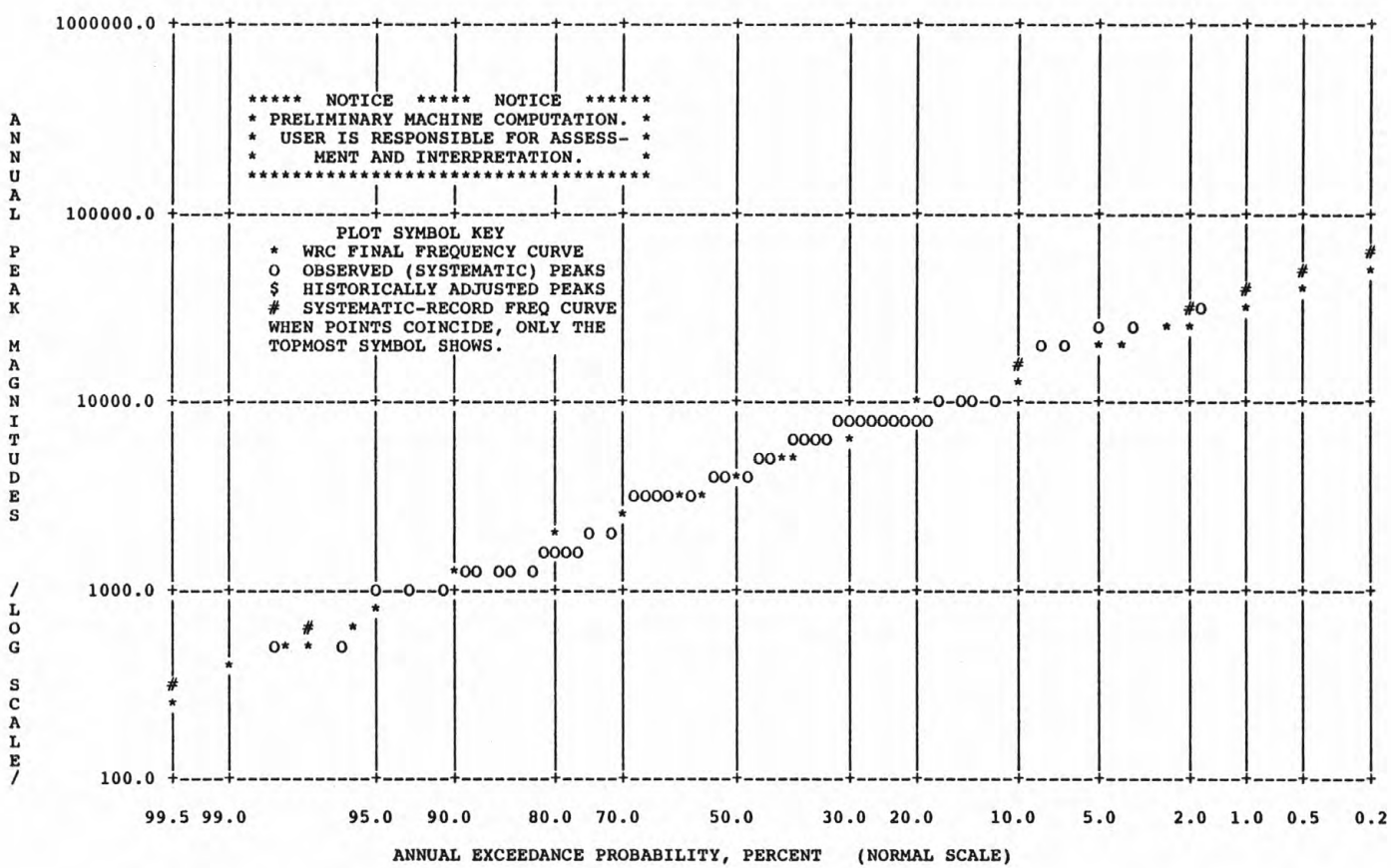


Figure 12.--Example of computer printout for peak flow frequency curve for the Knife River at Hazen.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

DISCHARGE-(CFS)

STATISTICS ON NORMAL MONTHLY MEANS (ALL DAYS)

	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
By rows (Number, Mean, Variance, Standard Deviation, Skewness, Coefficient of Variation, Percentage of Average Value)												
Number	57.00	57.00	57.00	57.00	57.00	57.00	58.00	57.00	58.00	58.00	58.00	59.00
Mean	36.68	31.11	21.40	20.15	88.66	703.05	563.07	172.25	246.96	112.32	48.10	35.54
Var	2336.33	826.94	155.96	603.05	24038.88	562256.75	726284.88	59908.14	62562.26	21942.17	1788.05	894.15
Std	48.34	28.76	12.49	24.56	155.04	749.84	852.22	244.76	250.12	148.13	42.29	29.90
Skew	5.86	5.49	2.36	3.45	3.36	1.60	2.56	3.70	1.51	4.06	1.88	2.07
Cvar	1.32	0.92	0.58	1.22	1.75	1.07	1.51	1.42	1.01	1.32	0.88	0.84
Pavg	1.76	1.50	1.03	0.97	4.26	33.81	27.08	8.28	11.88	5.40	2.31	1.71

Figure 13.--Example of computer printout for statistics computed on monthly mean discharges for the period of record on the Knife River at Hazen.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

DISCHARGE-(CFS)
NORMAL MONTHLY MEANS(ALL DAYS)

OCT	NOV	DEC	JAN	FEB	MARCH
		TWENTY FIFTH PERCENTILE			
17.2	19.0	13.4	7.71	9.78	169.5
		FIFTIETH PERCENTILE			
26.2	25.6	19.5	13.3	21.2	406.0
		SEVENTY FIFTH PERCENTILE			
39.8	35.5	28.3	19.5	105.8	1098

APRIL	MAY	JUNE	JULY	AUG	SEPT
		TWENTY FIFTH PERCENTILE			
96.8	54.8	65.4	30.3	16.8	18.4
		FIFTIETH PERCENTILE			
180.7	91.0	145.3	72.0	36.4	27.3
		SEVENTY FIFTH PERCENTILE			
721.7	176.7	319.2	134.4	66.8	43.5

NOTE -- PERCENTILES BASED ON AVAILABLE DATA

Figure 14.--Example of computer printout for quartile percentages of monthly mean discharges for the period of record on the Knife River at Hazen.

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION STATE 38 DIST 380

PRIMARY COMPUTATIONS OF GAGE HEIGHT AND DISCHARGE
06340500 DATE PROCESSED: 03-02-1991 @ 10:40 BY REHARKNESS

RATINGS USED --
INPUT 13.0 09/01/79 (0015)

KNIFE RIVER AT HAZEN, ND

STNRD 16.0 10/01/87 (0015)

OUTPUT PARAMETER 00060 STORE STATISTIC(S) 00003
PROVISIONAL DATA FOR WATER YEAR ENDING SEPT. 30, 1990

TEST DIFF: 10.00 PUNCH INTERVAL: 15 MIN

DATE	MAX GH /DISCH <TIME>	MIN GH /DISCH <TIME>	MEAN GH	MEAN DISCH	SHIFT ADJ	DATUM CORR	STAGE, IN HUNDREDTHS OF FEET, AT INDICATED HOURS 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400
05/23/90	1.35 19 <0015>	1.33 18 <1930>	1.35	19	0.07W	0.03	135 135 135 135 135 135 135 135 135 135 135 135 135 135 135 135 135 135 135 134 133 133 133 133
05/24/90	1.34 18 <0015>	1.32 18 <2015>	1.33	18	0.08W	0.03	133 133 133 133 133 133 133 133 133 134 134 134 134 134 134 134 134 133 133 133 132 132 132 132
05/25/90	1.45 23 <2345>	1.32 18 <0015>	1.35	19	0.07W	0.03	132 132 132 132 132 132 132 132 132 132 132 132 132 132 132 134 134 134 138 142 143 144 144 145
05/26/90	1.92 57 <2200>	1.45 23 <0015>	1.71	40	-0.01W	0.03	145 146 147 149 153 159 166 171 174 176 176 176 175 174 173 173 174 178 184 188 190 192 192 192
05/27/90	2.08 71 <0930>	1.86 51 <2400>	1.99	63	-0.02W	0.03	192 192 192 194 196 200 204 206 207 208 208 208 208 206 205 203 200 198 196 194 192 190 188 186
05/28/90	4.97 461 <1900>	1.79 46 <0530>	3.18	222	-0.07W	0.03	185 183 182 181 180 179 179 179 179 179 179 202 336 403 449 474 487 494 497 497 494 490 485 478
05/29/90	4.78 429 <0015>	3.28 205 <2400>	3.93	297	-0.12W	0.03	472 464 455 448 439 431 423 414 405 399 393 387 380 376 369 364 359 355 350 345 341 336 332 328
05/30/90	3.27 204 <0015>	2.64 128 <2400>	2.92	161	-0.07W	0.02	325 321 318 313 310 307 303 300 298 295 292 290 288 285 283 280 278 276 274 272 270 268 266 264
05/31/90	2.64 128 <0015>	2.32 95 <2330>	2.48	111	-0.05W	0.01	263 261 260 259 257 256 254 253 252 251 249 249 246 246 244 243 241 239 239 237 235 234 233 232
06/01/90	2.32 95 <0015>	2.11 74 <2245>	2.20	83	-0.04W	0.00	231 229 228 227 227 226 224 224 224 223 222 221 220 219 217 217 215 214 213 213 213 212 211 211
06/02/90	2.09 72 <0015>	1.99 63 <2300>	2.04	67	-0.03W	0.00	209 209 209 209 209 207 206 205 204 203 203 202 202 202 202 202 202 201 201 200 200 200 199 199
PERIOD	4.97 461	1.32 18			TIME CORRECTION 0.0		

NOTE. SYMBOLS USED ABOVE HAVE THE FOLLOWING MEANINGS --
W - SHIFT VARIES BY TIME AND VALUE - V SHIFT

Figure 15.--Example of "primary computation" computer printout for the Knife River at Hazen.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey North Dakota District office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are published with the water-quality records for each surface-water station in this report.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Samples for biochemical-oxygen demand (BOD) and samples for indicator bacteria are analyzed locally. Sediment samples are analyzed in the U.S. Geological Survey laboratory in Iowa City, Iowa or Rolla, Mo. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colo., the North Dakota State Water Commission laboratory in Bismarck, N.Dak., or the U.S. Bureau of Reclamation laboratory in Bismarck, N.Dak. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, and dissolved oxygen then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature recorder, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

When the water-quality data for this report was prepared for publication, not all of the parameter values requested from the analyzing laboratories were available. As these data values are received the computer files will be updated, but no attempt to publish these data will be made.

As part of the quality assurance procedures for the samples analyzed at the North Dakota State Water Commission laboratory, about 5 percent of the samples include a "split" sample which is sent to the U.S. Geological Survey laboratory in Arvada. The "split" samples analyzed in Arvada are not included in this report, but can be obtained upon request from the U.S. Geological Survey North Dakota District office.

Remark Codes

The following remark codes may appear with the water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
ND	Not detected. No colonies were present on the least dilute sample prepared.

NOTE: In March 1989 the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Records of Ground-Water Levels

Only water-level data from a network of selected observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the most important aquifers. Locations of the observation wells in this selected network in North Dakota are shown in figure 3.

The complete statewide network included more than 800 wells during 1990. About one-half of these wells were measured annually and the others at a variety of frequencies. Forty wells were equipped with continuous water-level recorders.

Data Collection and Computation

Measurements of water levels are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the township-range location of the well.

Water-level records are obtained from direct measurements with a steel tape or from the graph or punched tape of a water-stage recorder. The water-level measurements in this report are given in feet with reference to land-surface datum (LSD). Land-surface datum is a datum plane that is approximately at land surface at each well. The elevation of the land-surface datum is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels measured during the water year. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic-unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and/or screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the measurement method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 feet above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) National Geodetic Vertical Datum of 1929 (NGVD of 1929); it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water levels are listed. For wells equipped with recorders, only abbreviated tables are published; only water-level lows are listed for every fifth day and at the end of the month (EOM). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Taped measurements are not published for wells equipped with continuous recorders. Missing records are indicated by dashes in place of the water level.

Availability of Data

All water-level measurements and recorder data are stored in computer as well as office files and are available in a tabular listing similar to those published in this report. However, ground-water data usually are more easily analyzed when displayed graphically. Examples of computer-generated hydrographs for water levels in three wells published in this report are presented in figures 16a-18.

The hydrograph for well 139-078-27CBB in the McKenzie aquifer in Burleigh County is shown in figures 16a and 16b, and the reported water use for irrigation from the McKenzie aquifer (H. L. LaBore, North Dakota State Water Commission, oral commun., 1990) is shown in table 4. Very little fluctuation in water level occurred from 1963 until about 1972 (fig. 16a), and water-use data for the McKenzie aquifer (table 4) indicate that irrigation was insignificant until about 1972. Only annual water-level measurements at the end of the year were made during 1972-74 and the effect of irrigation withdrawals on the aquifer during the irrigation season cannot be detected on the hydrograph. Beginning in 1975, the frequency of water-level measurements was increased, and the annual declines in water level during the irrigation season and the recovery during the winter and spring can be seen in figure 16b. The largest annual decline in the water level, more than 7 feet, during the period of record for this well occurred during 1977. This decline corresponds to the largest reported water use for irrigation from the McKenzie aquifer (table 4).

Due to above normal precipitation during the 1986 irrigation season, reported water use for irrigation from the McKenzie aquifer (table 4) was the lowest since 1969. Reported water use also was less in 1987 than any year since 1970. The section of hydrograph for the 1986 through 1987 period for well 139-078-27CBB (see fig. 16b) does not show the decline in water level, during the irrigation season, that has become typical in recent years of larger withdrawals. Due to the drought of 1988, irrigation withdrawals increased to about 600 acre-feet in the McKenzie aquifer. With this increase in ground-water withdrawal from the aquifer, well 139-078-27CBB again experienced a significant decline during the 1988 irrigation season and a subsequent water-level recovery. Although the drought continued in 1989, it was not as severe as during 1988. During the 1989 water year, the drought continued. Although estimated water use from the McKenzie aquifer was less than during the 1988 water year, the water level during the irrigation season declined to a lower level than during the 1988 water year.

Table 4.--Reported water use, by year, for irrigation from the McKenzie aquifer, in acre-feet

Year	Water use	Year	Water use	Year	Water use	Year	Water use
1969	0	1975	182	1981	230	1987	118
1970	75	1976	338	1982	348	1988	600
1971	150	1977	781	1983	486	1989	412
1972	436	1978	183	1984	624	1990	e310
1973	416	1979	314	1985	477		
1974	400	1980	475	1986	20		

e Estimated.

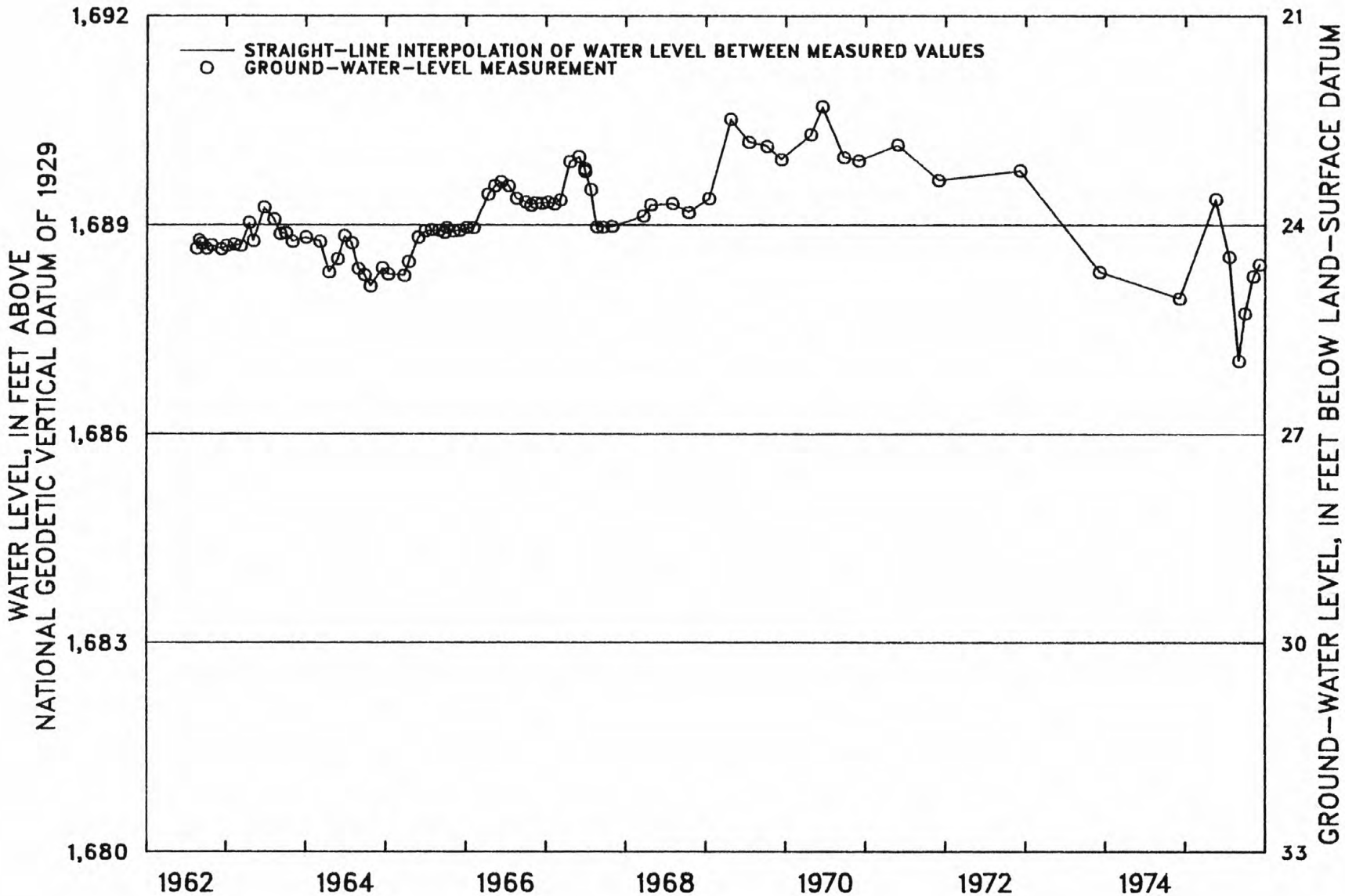


Figure 16a.--Water levels for well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1962-75.

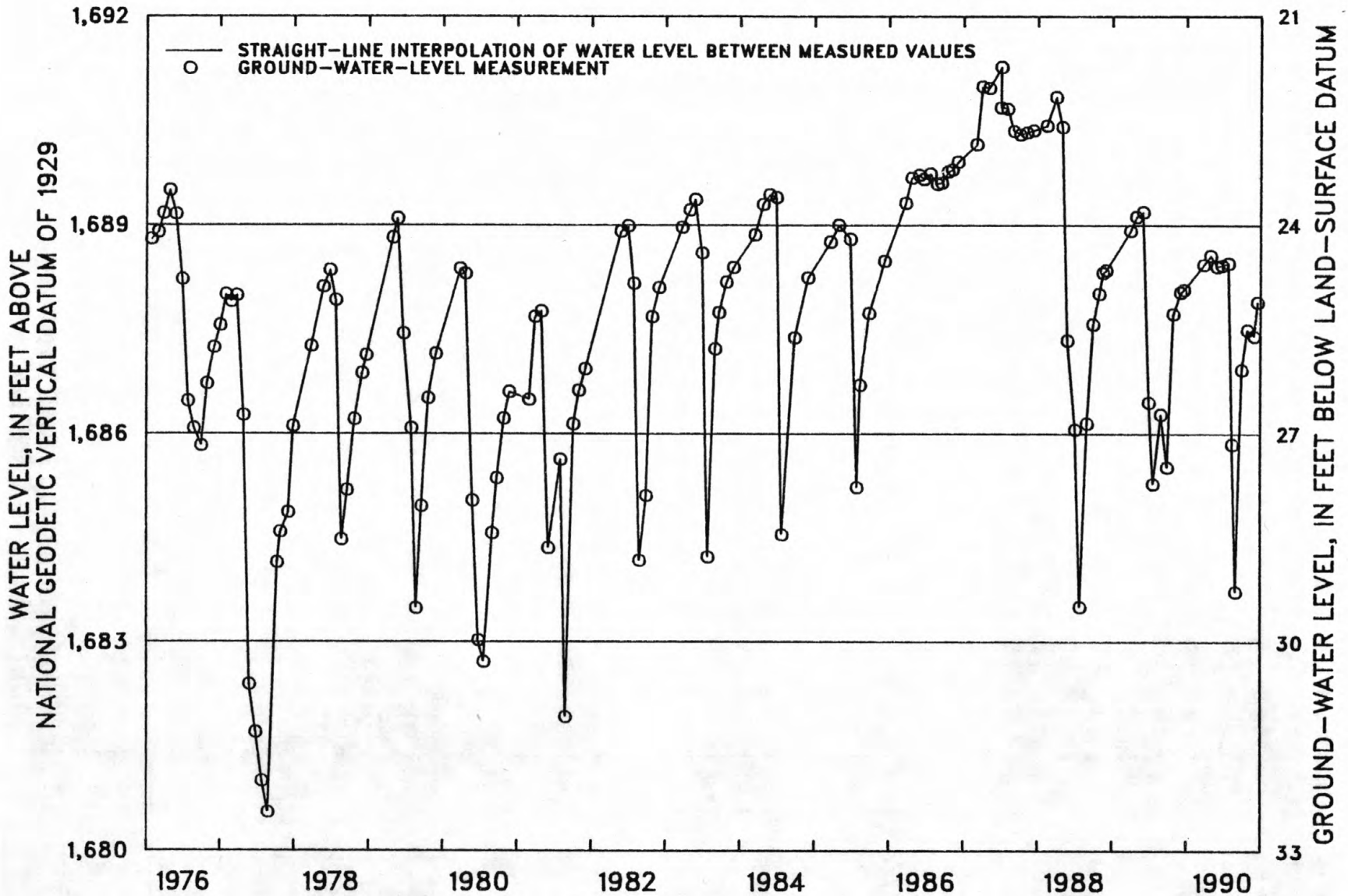


Figure 16b.--Water levels for well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1976-90.

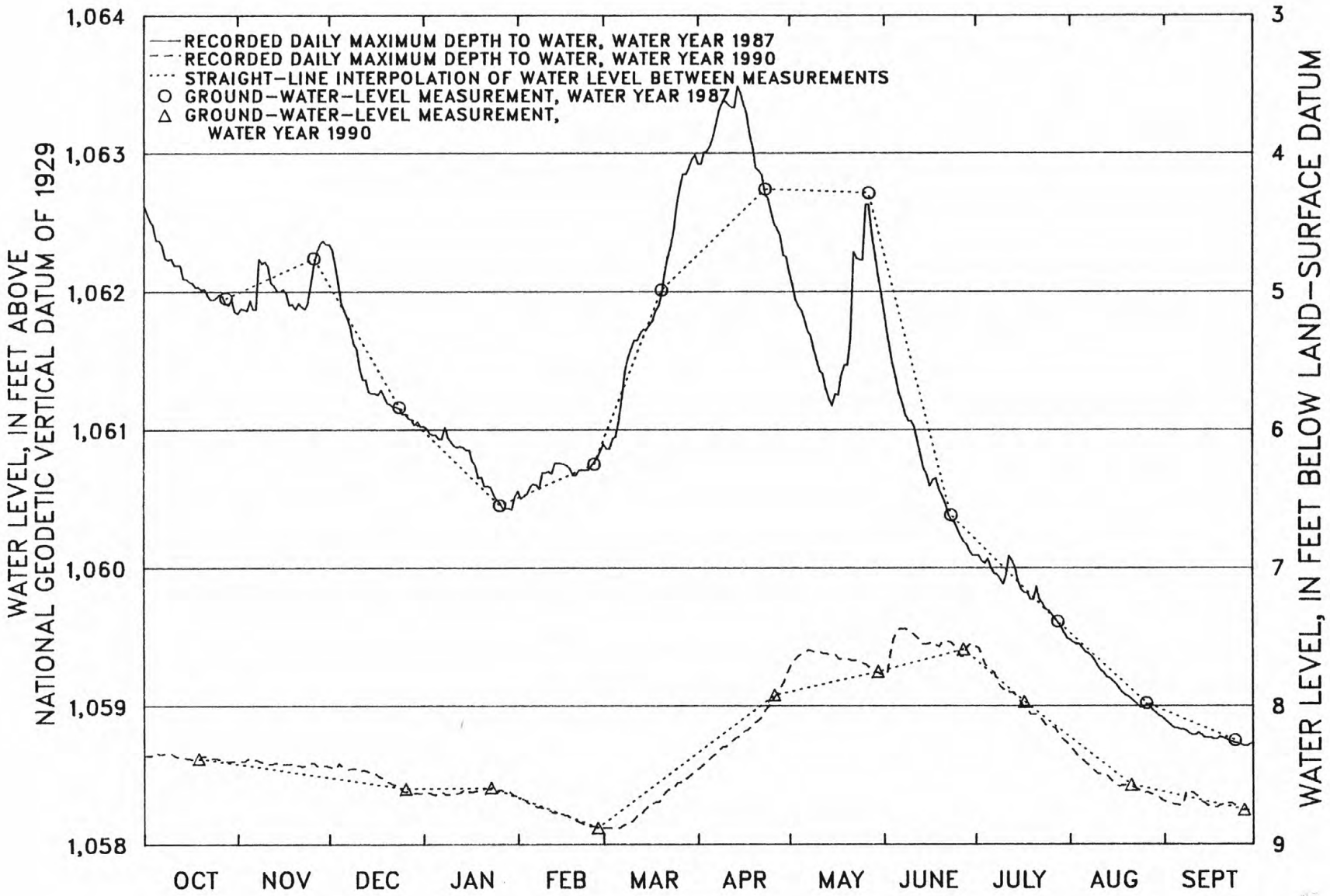


Figure 17.--Water levels for recorder well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, water years 1987 and 1990.

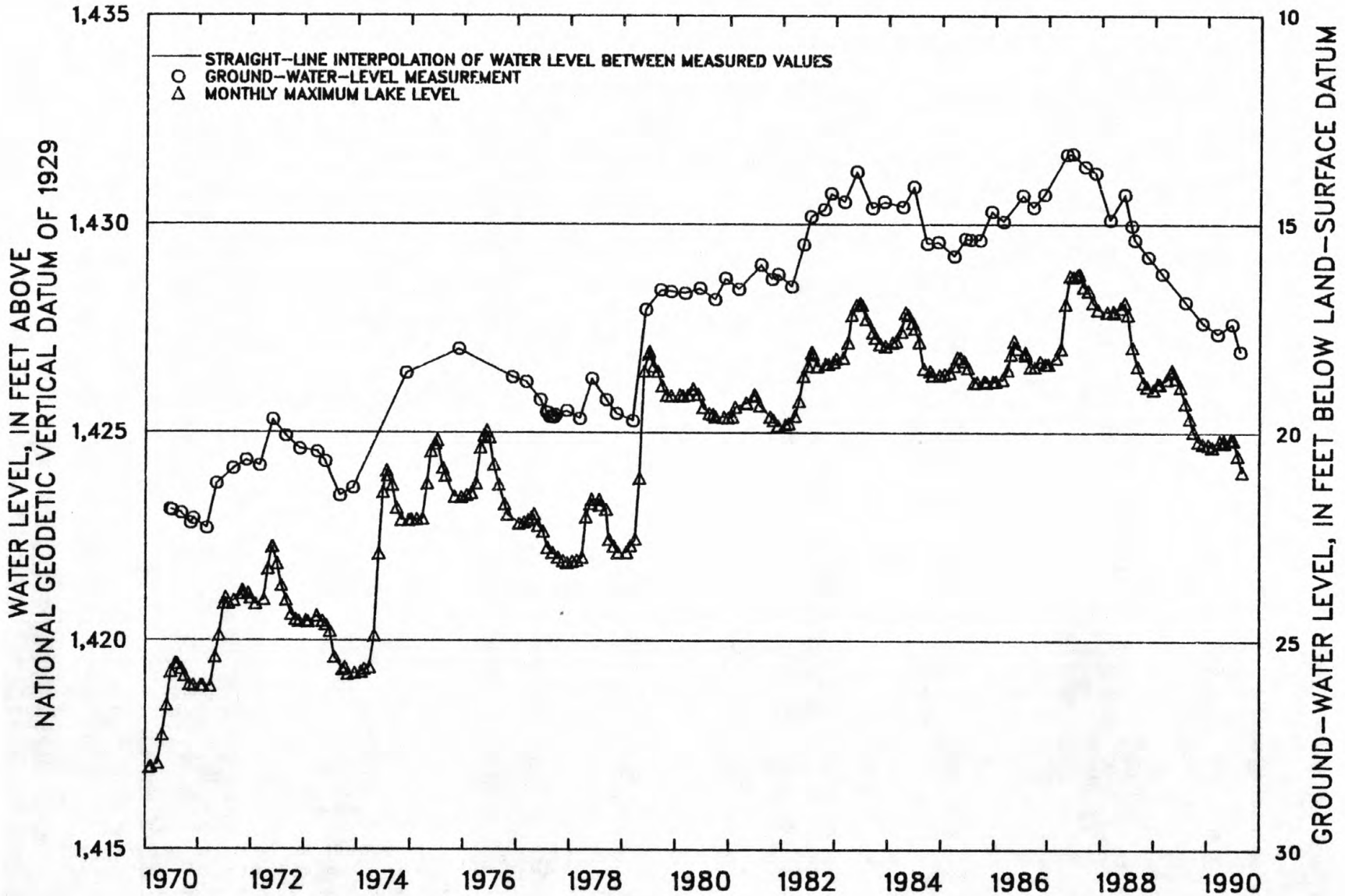


Figure 18.--Water levels for well 153-063-30CBC completed in Spiritwood aquifer, Benson County, and monthly maximum water levels for Devils Lake, 1970-90.

The 1987 and 1990 water year hydrographs of water levels in well 134-052-06CCD2 completed in the Sheyenne Delta aquifer in Richland County and equipped with a continuous recorder is shown in figure 17. The recorded daily maximum depth to water and the periodic water-level measurements are shown. The periodic measurements were made with a steel tape. A dotted line was drawn between the periodic measurements to illustrate the definition of changes indicated by periodic taped measurements as compared to definition of changes in water level that is provided when continuous recorder data are available. Although the general trend in water-level changes is provided by the periodic measurements (fig. 17), the water level in this well may fluctuate more than 2 feet between measurements. Straight-line interpolation between measurements would have been in error by more than one foot at this site at times during the 1987 water year. During the 1990 water year, when there was very little change in water level, straight-line interpolation between periodic measurements approximates the water level between measurements much better than during a year of greater fluctuations, such as the 1987 water year.

Ground-water data are recorded and stored as water levels in feet below land surface. Because the elevation of land surface is determined for all well sites, it is possible to relate water level below land surface to elevation above National Geodetic Vertical Datum of 1929. Both vertical scales are used on the hydrographs, water level below land surface on the right margin and water-level elevation above National Geodetic Vertical Datum of 1929 on the left margin (figs. 16a-18). Gage datum at lake and reservoir sites also can be directly related to National Geodetic Vertical Datum; therefore, both ground-water and surface-water elevation data can be plotted on one hydrograph to show the relationship that exists between the ground-water level, and the level of water in nearby lakes and reservoirs. The hydrographs for well 153-063-30CBC in Benson County and Devils Lake are shown in figure 18. Such comparison hydrographs are useful tools for analysis of ground-water/surface-water relationships.

Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that, for most sampling sites, they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for general purposes, one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

Data Collection and Computation

The records of ground-water quality in this report were obtained mostly as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some counties but none are presented for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide. Such a view can be attained only by considering records for this year in context with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water-Resources Investigations" manuals listed at the end of the introductory text. The values in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casing.

Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County, and are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

ACCESS TO WATSTORE DATA

The National WATer Data STOrage and REtrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Va.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from the office whose address is given on the back of the title page.

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 409
Reston, VA 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) units on the inside of the back cover.

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 about 326,000 gallons or 1,233 cubic meters.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C plus or minus 0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35 °C plus or minus 1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material (or bottom material) is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

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.

Crest-stage gage is a device for obtaining the elevation of the flood crest of a stream.

Cubic foot per second or cfs (ft^3/s) 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 or 0.02832 cubic meters per second.

Cubic foot per second-day (ft^3/s) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Cubic foot per second per square mile [$(ft^3/s)/mi^2$] 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.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45 um membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

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 specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

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 hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Micrograms per gram (ug/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

Normal as related to meteorological data published by the National Weather Service are computed as the average value of a meteorological element over a time period. Effective January 1, 1983, the averaging period is 1951 to 1980.

Parameter code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

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

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

pH indicates the degree of acidity or alkalinity of water and is expressed in terms of pH units. The pH value of a solution is the negative logarithm of the concentration of hydrogen ions, in moles per liter. A pH of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively less than 7.0 denote increasing acidity and those progressively greater than 7.0 denote increasing alkalinity. The pH of most natural surface waters ranges between 6 and 8.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN, 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.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage is the height of a water surface above an established datum plane; also gage height.

Stage-discharge relation is the relation between gage height (stage) and volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Surface area of a lake is that area outlined on the latest U.S. Geological Survey topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the the part of a representative water-suspended sediment sample that is retained on a 0.45 um membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 um membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (t/day) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Water year in U.S. Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1985, is called the "1985 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

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

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.

3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.

3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathbun, N. Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. *Levels of streamflow gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 pages.

3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

3-B2. *Introduction to ground-water hydraulics, a programmed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B4. *Regression modeling of ground-water flow*, by Richard L. Cooley and Richard L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-C1. *Fluvial sediment concepts*, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. *Field methods for measurement of fluvial sediment*, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. *Computation of rate and volume of stream depletion by wells*, by C. T. Jenkins: USGS-TWRI Book 4, Chapter D1. 1970. 17 pages.

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels*, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND

LOCATION.--Lat 46°15'55", long 96°35'40", in NE¼ sec.8, T.132 N., R.47 W., Richland County, Hydrologic Unit 09020104, 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 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1942 to October 1942, March 1943 to current year. Gage-height records collected in this vicinity since 1917 are contained in reports of the U.S. Weather Bureau.

GAGE.--Water-stage recorder and concrete and wooden dam. Datum of gage is 942.97 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Nov. 19 to Mar. 9 and Mar. 14-29. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation 1,070 ft above National Geodetic Vertical Datum of 1929, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control; numerous other controlled lakes and ponds, and several powerplants.

AVERAGE DISCHARGE.--47 years (1944-90), 543 ft³/s, 393,400 acre-ft/yr; median of yearly mean discharges, 480 ft³/s, 348,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,200 ft³/s, Apr. 10, 1969, gage height, 16.34 ft; maximum gage height, 17.95 ft, Apr. 5, 1989; minimum daily, 1.7 ft³/s, Aug. 28 to Sept. 5, 9, 10, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 17.0 ft, discharge, 10,500 ft³/s, occurred in the spring of 1897 and has not been exceeded since.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 900 ft³/s, Mar. 18, gage height, 5.72 ft, backwater from ice; minimum daily, 61 ft³/s, Nov. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	303	83	e160	e98	e107	e210	493	563	514	542	248	261
2	303	80	e125	e98	e107	e220	474	578	521	539	240	204
3	296	61	e106	e98	e107	e230	500	575	532	496	228	193
4	290	123	e147	e99	e120	e240	549	581	539	427	175	193
5	288	115	e160	e99	e130	e250	548	612	526	416	179	215
6	277	106	e150	e99	e140	e260	522	613	522	418	185	243
7	256	104	e117	e100	e150	e270	483	605	521	415	220	205
8	233	104	e116	e100	e160	e289	415	536	510	423	277	128
9	221	105	e114	e102	e170	e315	399	432	499	421	275	94
10	213	116	e113	e104	e180	335	382	421	496	399	251	87
11	183	141	e112	e105	e190	361	362	446	492	367	247	110
12	134	144	e111	e106	e188	456	350	485	481	335	252	190
13	128	142	e110	e107	e185	491	326	489	459	330	252	203
14	120	145	e109	e108	e180	e570	334	505	456	341	236	198
15	110	151	e108	e109	e178	e640	312	502	519	341	227	167
16	107	80	e107	e110	e175	e720	310	498	604	343	186	163
17	109	90	e106	e111	e170	e800	315	494	608	386	158	162
18	109	94	e105	e120	e170	e880	331	501	607	465	175	154
19	110	e130	e103	e130	e170	e850	374	503	599	515	169	123
20	115	e140	e101	e140	e180	e800	395	503	569	537	168	114
21	123	e192	e100	e150	e190	e740	399	496	562	506	180	117
22	98	e180	e99	e160	e200	e640	401	493	559	433	197	121
23	96	e158	e98	e170	e198	e560	405	497	552	416	239	122
24	95	e145	e97	e169	e190	e520	404	496	532	372	229	122
25	87	e147	e96	e169	e180	e500	406	494	533	312	229	129
26	79	e160	e96	e169	e189	e495	435	496	529	310	334	145
27	76	e170	e96	e169	e198	e460	449	499	493	308	319	147
28	81	e180	e96	e169	e200	e451	495	499	481	292	301	141
29	79	e172	e96	e150	---	e445	553	490	496	254	296	125
30	79	e170	e97	e120	---	457	557	491	537	249	294	121
31	80	---	e98	e110	---	488	---	515	---	250	291	---
TOTAL	4878	3928	3449	3848	4702	14943	12678	15908	15848	12158	7257	4697
MEAN	157	131	111	124	168	482	423	513	528	392	234	157
MAX	303	192	160	170	200	880	557	613	608	542	334	261
MIN	76	61	96	98	107	210	310	421	456	249	158	87
AC-FT	9680	7790	6840	7630	9330	29640	25150	31550	31430	24120	14390	9320

CAL YR 1989 TOTAL 204353 MEAN 560 MAX 8310 MIN 31 AC-FT 405300
WTR YR 1990 TOTAL 104294 MEAN 286 MAX 880 MIN 61 AC-FT 206900

e Estimated

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
18...	1030	109	542	--	3.0	5.5	--	--	--	--	--	--
NOV												
30...	1110	170	700	--	0.5	0.5	--	--	--	--	--	--
JAN												
17...	1540	111	664	--	-3.5	0.5	--	--	--	--	--	--
APR												
04...	1215	551	585	8.1	8.0	11.0	220	40	28	11	10	0.3
MAY												
02...	1815	582	460	--	18.5	12.0	--	--	--	--	--	--
JUN												
06...	0820	526	458	--	12.5	15.0	--	--	--	--	--	--
JUL												
10...	0950	409	485	--	23.0	24.0	--	--	--	--	--	--
AUG												
22...	0715	187	410	8.1	17.5	20.0	200	34	28	9.0	9	0.3
SEP												
25...	1620	131	450	--	17.5	18.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	6.3	250	0	210	27	14	0.10	15	259	267	0.35
AUG											
22...	2.5	240	0	199	17	11	0.10	11	251	232	0.34

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
04...	385	2	50	30	<1	13	30	0.1	1	<1	220
AUG											
22...	127	3	60	20	1	13	10	0.1	<1	<1	220

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96°47'44", in SW¼ sec.19, T.137 N., R.48 W., Clay County, MN, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road, and 1 mi southeast of Hickson, ND.

DRAINAGE AREA.--4,300 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 877.06 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 20 to Jan. 6, Jan. 31 to Feb. 4, and Feb. 12-26. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation 1,070 ft above National Geodetic Vertical Datum of 1929, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control, numerous other controlled lakes and ponds, and several powerplants.

AVERAGE DISCHARGE.--15 years, 593 ft³/s, 429,600 acre-ft/yr; median of yearly mean discharges, 530 ft³/s, 38,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,900 ft³/s, Apr. 7, 1989, gage height, 35.81 ft; no flow Oct. 26, 1976, to Jan. 9, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 857 ft³/s, Apr. 2, gage height, 11.26 ft; minimum daily discharge, 70 ft³/s, Dec. 23, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	184	90	e139	e80	e100	166	716	567	527	534	259	306
2	228	92	e150	e81	e96	165	829	574	590	566	257	296
3	290	91	e160	e83	e100	161	804	586	573	572	261	257
4	301	82	e150	e84	e120	161	702	591	571	561	256	211
5	297	98	e131	e86	120	149	676	580	577	504	238	202
6	294	119	e121	e90	115	133	562	589	579	452	201	202
7	290	134	e110	90	116	131	521	605	566	441	197	226
8	277	124	e107	84	118	131	503	606	559	445	199	246
9	253	120	e104	77	121	136	439	583	560	445	230	203
10	230	120	e101	83	117	141	382	499	542	445	281	145
11	205	117	e98	85	119	151	360	428	523	458	280	112
12	196	127	e96	82	e135	187	343	420	517	439	260	97
13	181	145	e93	84	e120	226	333	453	508	392	257	112
14	158	158	e90	87	e115	307	316	480	492	360	260	168
15	140	161	e88	76	e110	364	312	489	481	356	256	186
16	129	116	e85	84	e105	387	306	497	490	363	242	187
17	117	91	e82	88	e102	456	300	499	567	369	230	167
18	116	113	e80	88	e106	543	300	498	623	377	201	166
19	117	109	e78	88	e110	628	307	498	639	420	179	174
20	114	e150	e76	107	e130	653	339	507	642	480	180	166
21	115	e160	e73	131	e140	638	384	515	616	530	176	138
22	116	e150	e71	138	e130	610	405	517	594	548	180	122
23	125	e140	e70	140	e120	560	412	512	592	509	201	123
24	122	e130	e70	142	e110	508	412	508	588	457	223	127
25	116	e140	e71	143	e120	449	408	507	577	432	247	130
26	116	e150	e72	145	e130	349	404	509	566	381	256	130
27	106	e160	e74	145	141	360	405	505	582	341	270	128
28	93	e150	e75	142	152	494	436	506	563	333	328	139
29	88	e140	e76	141	---	538	465	507	532	327	325	142
30	90	e120	e78	130	---	555	525	504	512	300	310	143
31	88	---	e79	e110	---	613	---	503	---	267	305	---
TOTAL	5292	3797	2948	3214	3318	11050	13606	16142	16848	13404	7545	5151
MEAN	171	127	95.1	104	118	356	454	521	562	432	243	172
MAX	301	161	160	145	152	653	829	606	642	572	328	306
MIN	88	82	70	76	96	131	300	420	481	267	176	97
AC-FT	10500	7530	5850	6370	6580	21920	26990	32020	33420	26590	14970	10220

CAL YR 1989 TOTAL 227983 MEAN 625 MAX 12000 MIN 40 AC-FT 452200
WTR YR 1990 TOTAL 102315 MEAN 280 MAX 829 MIN 70 AC-FT 202900

e Estimated

05051522 RED RIVER OF THE NORTH AT HICKSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
18...	1555	117	550	--	9.0	6.0	--	--	--	--	--	--
JAN												
17...	1300	88	875	--	-2.5	0.0	--	--	--	--	--	--
APR												
11...	1430	359	545	8.5	2.0	7.5	230	43	29	15	12	0.4
25...	1000	408	540	--	15.0	18.0	--	--	--	--	--	--
JUN												
06...	1415	577	590	--	15.5	19.5	--	--	--	--	--	--
JUL												
09...	1530	445	505	--	29.5	28.0	--	--	--	--	--	--
AUG												
23...	0930	215	430	8.3	21.5	22.5	210	36	30	10	9	0.3
SEP												
26...	1205	130	652	--	23.0	11.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
11...	6.8	230	0	190	51	15	0.10	13	302	287	0.41
AUG											
23...	3.1	260	0	213	25	11	0.10	12	245	255	0.33

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
11...	293	2	70	250	1	18	50	0.1	1	<1	230
AUG											
23...	142	4	60	20	<1	14	10	<0.1	1	<1	200

05051600 WILD RICE RIVER NEAR RUTLAND, ND

LOCATION.--Lat 46°01'20", long 97°30'40", in $SE^1/_4SE^1/_4$ sec.36, T.130 N., R.55 W., Sargent County, Hydrologic Unit 09020105, on right bank 1,000 ft upstream from bridge on county highway, 2 mi south of Rutland, and 10 mi upstream from Lake Tewaukon.

DRAINAGE AREA.--546 mi^2, of which about 250 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1959 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,197.73 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 11, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good.

AVERAGE DISCHARGE.--23 years (water years 1960-82), 8.08 ft^3/s, 5,850 acre-ft/yr; median of yearly mean discharges, 4.7 ft^3/s, 3,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,270 ft^3/s, Apr. 8, 1969, gage height, 8.77 ft, backwater from ice; maximum gage height, 8.78 ft, Apr. 8, 1969, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--No flow for entire period.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND

LOCATION.--Lat 46°28'05", long 96°47'00", in NE¼NE¼ sec.36, T.135 N., R.49 W., Richland County, Hydrologic Unit 09020105, on right bank 420 ft upstream from bridge on county highway, 0.75 mi upstream from rubble masonry dam which serves as control, 3.2 mi northwest of Abercrombie, and 7 mi downstream from Antelope Creek.

DRAINAGE AREA.--2,080 mi², of which about 590 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1388: 1939, 1941(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 907.94 ft above National Geodetic Vertical Datum of 1929. 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 mi downstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 5-14 and Feb. 21 to Mar. 26. Records good except those for periods of estimated daily discharges, which are fair. Some regulation by Fish and Wildlife Service reservoirs, of which Lake Tewaukon is the largest. Some small diversions for irrigation.

AVERAGE DISCHARGE.--58 years, 72.7 ft³/s, 52,670 acre-ft/yr; median of yearly mean discharges, 36 ft³/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,540 ft³/s, Apr. 11, 1969, gage height, 24.58 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1897 reached a stage of 27.5 ft, present site and datum, from floodmarks pointed out by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 2	0100	74	2.12	No other peak greater than base discharge.			

No flow much of the time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.00	.00	.00	.00	e.00	57	15	1.8	.11	.00	.00
2	.04	.00	.00	.00	.00	e.00	61	17	1.8	.09	.00	.00
3	.03	.00	.00	.00	.00	e.00	37	18	1.7	.09	.00	.00
4	.02	.00	.00	.00	.00	e.00	35	20	1.8	.07	.00	.00
5	.03	.00	e.00	.00	.00	e.00	26	18	1.7	.06	.00	.00
6	.02	.00	e.00	.00	.00	e.00	21	17	1.7	.05	.00	.00
7	.02	.00	e.00	.00	.00	e.00	21	14	2.1	.04	.00	.00
8	.02	.00	e.00	.00	.00	e.00	19	14	2.1	.03	.00	.00
9	.02	.00	e.00	.00	.00	e.00	17	13	1.7	.02	.00	.00
10	.01	.00	e.00	.00	.00	e.00	17	12	1.6	.01	.00	.00
11	.02	.00	e.00	.00	.00	e.00	17	11	1.3	.04	.00	.00
12	.02	.00	e.00	.00	.00	e.20	16	9.5	1.0	.04	.00	.00
13	.02	.00	e.00	.00	.00	e.50	14	8.1	.86	.03	.00	.00
14	.02	.00	e.00	.00	.00	e1.0	12	7.7	.71	.02	.00	.00
15	.02	.00	.00	.00	.00	e2.0	10	6.0	.66	.00	.00	.00
16	.01	.00	.00	.00	.00	e3.0	8.4	5.3	.60	.00	.00	.00
17	.01	.00	.00	.00	.00	e4.0	7.6	5.5	.52	.00	.00	.00
18	.01	.00	.00	.00	.00	e5.0	6.8	5.0	.45	.00	.00	.00
19	.00	.00	.00	.00	.00	e6.0	5.7	4.6	.49	.00	.00	.00
20	.00	.00	.00	.00	.00	e7.0	4.9	3.9	.47	.00	.00	.00
21	.00	.00	.00	.00	e.00	e8.0	4.4	3.2	.38	.00	.00	.00
22	.00	.00	.00	.00	e.00	e9.0	3.8	2.8	.32	.00	.00	.00
23	.00	.00	.00	.00	e.00	e10	3.6	2.3	.26	.00	.00	.00
24	.00	.00	.00	.00	e.00	e12	3.0	1.7	.22	.00	.00	.00
25	.00	.00	.00	.00	e.00	e14	2.5	1.2	.19	.00	.00	.00
26	.00	.00	.00	.00	e.00	e17	2.5	1.0	.16	.00	.00	.00
27	.00	.00	.00	.00	e.00	22	2.2	.91	.16	.00	.00	.00
28	.00	.00	.00	.00	e.00	27	2.8	1.3	.16	.00	.00	.00
29	.00	.00	.00	.00	---	32	3.1	1.9	.14	.00	.00	.00
30	.00	.00	.00	.00	---	37	4.6	2.2	.12	.00	.00	.00
31	.00	---	.00	.00	---	49	---	2.0	---	.00	.00	---
TOTAL	0.37	0.00	0.00	0.00	0.00	265.70	445.9	245.11	27.17	0.70	0.00	0.00
MEAN	.012	.000	.000	.000	.000	8.57	14.9	7.91	.91	.023	.000	.000
MAX	.04	.00	.00	.00	.00	49	61	20	2.1	.11	.00	.00
MIN	.00	.00	.00	.00	.00	.00	2.2	.91	.12	.00	.00	.00
AC-FT	.7	.00	.00	.00	.00	527	884	486	54	1.4	.00	.00

CAL YR 1989 TOTAL 57746.30 MEAN 158 MAX 7110 MIN .00 AC-FT 114500
WTR YR 1990 TOTAL 984.95 MEAN 2.70 MAX 61 MIN .00 AC-FT 1950

e Estimated

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
18...	1350	0.01	1500	--	9.5	7.5	--	--	--	--	--	--
MAR												
28...	1315	28	850	--	8.0	1.0	--	--	--	--	--	--
APR												
02...	1145	61	740	8.0	2.5	4.0	260	59	28	41	24	1
MAY												
03...	1035	17	1010	--	16.0	10.5	--	--	--	--	--	--
JUN												
06...	1100	1.8	875	8.2	25.5	19.0	490	100	57	89	28	2
JUL												
10...	1125	0.02	830	--	26.5	28.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	12	230	0	190	140	24	0.20	15	453	433	0.62
JUN											
06...	14	390	0	319	310	42	0.30	7.6	834	812	1.13

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	74.2	2	100	50	<1	38	400	0.1	3	<1	350
JUN											
06...	3.96	8	190	20	<1	81	160	<0.1	<1	<1	520

05054000 RED RIVER OF THE NORTH AT FARGO, ND

LOCATION.--Lat 46°51'40", long 96°47'00", in NW¼NE¼ sec.18, T.139 N., R.48 W., Cass County, Hydrologic Unit 09020104, at waterplant on 4th St. S. in Fargo, 25 mi upstream from mouth of Sheyenne River, and at mi 453.

DRAINAGE AREA.--6,800 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 861.8 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1960, to Sept. 30, 1962, water-stage recorder at present site at datum 5.6 ft higher. See WSP 1728 or 1913 for history of changes prior to Oct. 1, 1960.

REMARKS.--Estimated daily discharges: Nov. 27-29 and Dec. 3 to Mar. 31. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation 1,070 ft above National Geodetic Vertical Datum of 1929, 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 diversions to cities of Fargo and Moorhead and from Sheyenne River.

AVERAGE DISCHARGE (UNADJUSTED).--89 years, 575 ft^3/s, 416,600 acre-ft/yr; median of yearly mean discharges, 449 ft^3/s, 325,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,300 ft^3/s, 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, Oct. 10-19, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1897, reached a stage of 39.1 ft present datum, discharge, 25,000 ft^3/s at site 1.5 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,220 ft^3/s, June 2, gage height, 15.40 ft; minimum daily discharge, 67 ft^3/s, Jan. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191	99	134	e80	e117	e180	713	544	537	484	227	303
2	197	97	129	e80	e115	e165	743	568	877	511	230	297
3	243	98	e130	e75	e115	e160	824	583	875	529	228	286
4	284	101	e140	e72	e120	e150	808	595	749	527	225	235
5	293	87	e135	e72	e120	e155	750	597	660	511	227	211
6	294	89	e122	e85	e130	e145	731	595	623	454	204	200
7	292	106	e120	e100	e140	e130	676	618	591	416	176	235
8	291	122	e119	e100	e135	e124	629	646	568	406	170	223
9	279	119	e117	e96	e135	e131	568	631	560	401	170	229
10	270	116	e115	e100	e132	e135	489	598	549	391	208	193
11	249	113	e115	e95	e135	e150	452	510	527	417	245	143
12	224	113	e114	e90	e150	e217	425	465	532	418	253	108
13	201	118	e112	e85	e150	e217	403	482	508	383	243	90
14	188	133	e110	e78	e145	e280	385	512	493	346	242	105
15	169	142	e110	e72	e145	e270	366	512	506	323	239	155
16	157	133	e100	e70	e142	e275	357	520	479	322	235	179
17	149	110	e90	e69	e140	e285	345	526	491	323	222	181
18	142	95	e85	e69	e165	e300	330	526	566	329	238	205
19	138	104	e80	e69	e165	e400	328	527	698	343	195	181
20	135	108	e75	e67	e180	e550	339	534	703	384	177	179
21	137	134	e70	e82	e195	e610	361	534	664	448	175	165
22	139	169	e70	e100	e180	e600	396	559	619	492	171	142
23	140	183	e70	e120	e175	e565	409	536	586	494	184	135
24	149	172	e75	e120	e160	e520	408	522	575	450	192	130
25	143	161	e75	e120	e158	e490	410	518	564	412	220	128
26	132	155	e82	e125	e165	e430	404	546	543	386	273	124
27	122	e155	e89	e127	e160	e380	412	533	596	340	259	117
28	117	e153	e95	e125	e160	e413	471	526	558	307	277	117
29	108	e152	e85	e122	---	e470	463	525	527	290	311	131
30	105	150	e82	e120	---	e540	481	528	495	281	307	135
31	102	---	e82	e120	---	e600	---	528	---	254	301	---
TOTAL	5780	3787	3127	2905	4129	10037	14876	16944	17819	12372	7024	5262
MEAN	186	126	101	93.7	147	324	496	547	594	399	227	175
MAX	294	183	140	127	195	610	824	646	877	529	311	303
MIN	102	87	70	67	115	124	328	465	479	254	170	90
AC-FT	11460	7510	6200	5760	8190	19910	29510	33610	35340	24540	13930	10440
(+)	1168	1058	1105	1061	985	1076	1083	1254	1239	1442	1719	1379
MEAN*	205	144	119	111	165	342	514	567	615	424	255	198
AC-FT*	12630	8570	7300	6820	9180	20990	30590	34860	36580	26070	15650	11820

		OBSERVED					ADJUSTED		
CAL YR 1989	TOTAL 301138	MEAN 825	MAX 18600	MIN 22	AC-FT 597300	MEAN	831	AC-FT	602,100
WTR YR 1990	TOTAL 104062	MEAN 285	MAX 877	MIN 67	AC-FT 206400	MEAN	305	AC-FT	221,000

\+ - Diversions in acre-feet to cities of Fargo and Moorhead. e - Estimated
* - Adjusted for diversions to cities of Fargo and Moorhead.

05054000 RED RIVER OF THE NORTH AT FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)
OCT												
12...	1005	227	905	--	13.5	9.0	--	--	--	--	--	--
NOV												
30...	1700	150	615	--	1.0	0.5	--	--	--	--	--	--
JAN												
17...	0925	69	850	--	-3.5	0.5	--	--	--	--	--	--
MAR												
08...	1045	123	710	--	1.0	0.5	--	--	--	--	--	--
28...	0930	403	545	--	5.0	0.5	--	--	--	--	--	--
APR												
11...	1145	464	510	8.6	2.0	6.0	230	44	28	14	12	0.4
24...	1635	405	485	--	29.0	6.5	--	--	--	--	--	--
JUN												
07...	0910	600	510	--	19.5	15.5	--	--	--	--	--	--
JUL												
09...	1235	407	451	--	28.0	26.5	--	--	--	--	--	--
AUG												
17...	1020	222	500	8.5	29.5	28.5	230	41	31	16	13	0.5
SEP												
26...	1430	136	625	--	22.0	18.5	--	--	--	--	--	--

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE, FET-LAB (MG/L AS HCO3) (95440)	CARBONATE, FET-LAB (MG/L AS CO3) (95445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
APR											
11...	7.1	250	0	200	45	16	0.10	14	312	292	0.42
AUG											
17...	3.2	260	0	214	47	14	0.10	13	317	294	0.43

DATE	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
APR											
11...	391	2	60	220	<1	17	40	0.1	1	1	240
AUG											
17...	190	5	90	20	1	20	<10	0.1	<1	<1	270

05054500 SHEYENNE RIVER ABOVE HARVEY, ND

LOCATION.--Lat 47°42'10", long 99°56'55", in SW¼SE¼ sec.24, T.149 N., R.73 W., Wells County, Hydrologic Unit 09020202, on right bank just downstream from county road, and 4.5 mi south of Harvey.

DRAINAGE AREA.--424 mi², of which about 270 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,547.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 30 to Apr. 18 and Aug. 28 to Sept. 26. Records good except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--35 years, 8.08 ft³/s, 5,850 acre-ft/yr; median of yearly mean discharges, 6.0 ft³/s, 4,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,000 ft³/s, Apr. 20, 1979, gage height, 9.45 ft; maximum gage height, 10.30 ft, Apr. 1, 1971, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 29	2100	*18.0	*5.81				

Minimum daily discharge, 0.17 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	e4.7	e2.8	e1.4	e.80	e1.2	e3.1	3.4	3.1	6.9	1.3	e.90
2	1.6	e4.3	e2.8	e1.2	e.90	e1.2	e3.0	3.1	4.8	7.8	1.5	e.70
3	1.5	e4.0	e3.0	e1.1	e1.0	e1.3	e3.2	2.9	6.4	6.3	1.3	e2.0
4	2.3	e4.0	e2.5	e1.0	e1.1	e1.2	e3.6	2.7	4.9	5.8	1.2	e1.7
5	1.9	e4.0	e2.3	e1.1	e1.1	e1.2	e3.2	2.9	4.7	10	1.1	e3.0
6	1.8	e4.5	e2.0	e1.2	e1.2	e1.2	e3.0	2.7	4.7	15	1.0	e2.6
7	1.4	e4.3	e1.9	e1.3	e1.2	e1.3	e2.8	2.9	4.5	17	1.5	e2.0
8	1.5	e4.1	e1.8	e1.3	e1.2	e1.4	e2.7	2.6	5.1	14	.76	e1.7
9	1.6	e4.0	e1.7	e1.4	e1.1	e1.5	e3.0	2.2	4.6	12	.78	e1.3
10	1.7	e4.0	e1.5	e1.5	e1.2	e1.6	e2.7	2.0	4.5	9.3	1.4	e1.0
11	1.8	e4.2	e1.4	e1.3	e1.2	e2.0	e2.5	2.1	4.5	8.8	1.2	e.80
12	1.7	e3.7	e1.3	e1.2	e1.3	e1.8	e2.3	1.8	4.4	7.2	1.2	e.70
13	1.5	e3.3	e1.2	e1.1	e1.2	e1.7	e2.5	2.1	5.0	6.1	1.2	e.60
14	1.2	e2.8	e1.1	e1.2	e1.2	e1.7	e2.5	1.7	4.6	5.2	.99	e.50
15	1.3	e2.5	e.90	e1.1	e1.2	e1.6	e2.7	2.5	4.5	4.5	.68	e.40
16	1.2	e2.3	e.75	e1.0	e1.1	e1.8	e2.5	4.5	4.3	4.3	.84	e.30
17	1.2	e2.4	e.60	e1.0	e1.0	e2.5	e2.5	3.8	4.9	5.3	.78	e.35
18	1.1	e2.5	e.50	e.90	e.90	e3.5	e2.8	2.9	4.6	5.5	.28	e.35
19	1.2	e2.8	e.40	e.90	e.90	e4.3	2.7	3.1	8.9	5.3	.23	e.40
20	1.3	e3.0	e.50	e.85	e1.0	e5.0	2.5	2.9	6.1	5.4	.23	e1.5
21	1.4	e2.6	e.50	e.90	e1.1	e4.0	1.9	2.7	5.1	4.9	.30	e1.7
22	1.4	e2.4	e.60	e1.0	e1.1	e3.0	1.9	2.6	4.8	4.3	.27	e1.6
23	1.3	e2.3	e.70	e1.1	e1.0	e2.5	2.3	2.5	4.5	3.9	.19	e1.6
24	1.8	e2.2	e.80	e1.1	e.95	e2.4	2.4	2.5	4.2	3.5	.17	e1.5
25	1.7	e2.5	e1.0	e1.2	e1.0	e2.3	4.2	2.4	4.0	3.2	.33	e1.5
26	2.1	e2.5	e1.3	e1.3	e1.1	e2.3	3.9	4.1	3.8	2.9	1.1	e1.4
27	3.0	e2.4	e1.2	e1.2	e1.1	e2.5	3.6	3.8	7.8	2.6	1.7	.79
28	3.5	e2.3	e1.1	e1.2	e1.1	e2.6	3.4	3.6	7.3	2.3	e1.5	.60
29	6.1	e2.3	e1.1	e1.1	---	e2.8	3.8	3.1	5.8	2.1	e1.2	5.1
30	e5.4	e2.6	e1.0	e1.0	---	e3.5	3.7	2.8	5.4	2.0	e1.3	5.7
31	e5.0	---	e1.2	e.90	---	e3.0	---	2.9	---	1.5	e1.1	---
TOTAL	63.5	95.5	41.45	35.05	30.25	69.9	86.9	87.8	151.8	194.9	28.63	44.29
MEAN	2.05	3.18	1.34	1.13	1.08	2.25	2.90	2.83	5.06	6.29	.92	1.48
MAX	6.1	4.7	3.0	1.5	1.3	5.0	4.2	4.5	8.9	17	1.7	5.7
MIN	1.1	2.2	.40	.85	.80	1.2	1.9	1.7	3.1	1.5	.17	.30
AC-FT	126	189	82	70	60	139	172	174	301	387	57	88

CAL YR 1989 TOTAL 1178.18 MEAN 3.23 MAX 60 MIN .00 AC-FT 2340
WTR YR 1990 TOTAL 929.97 MEAN 2.55 MAX 17 MIN .17 AC-FT 1840

e Estimated

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT												
05...	0904	1.3	1290	8.0	6.5	6.0	42	8.5	69	120	30	12
DEC												
05...	1300	2.3	2100	8.4	1.5	0.0	65	6.9	48	160	28	22
JAN												
12...	0904	1.2	1440	8.0	-4.0	0.0	45	3.7	25	85	20	8.4
FEB												
15...	1405	1.2	1390	8.3	-5.0	0.0	15	12.2	83	89	22	8.3
MAR												
19...	1336	4.2	1660	8.4	7.0	1.0	55	10.8	76	120	22	16
APR												
03...	1325	3.2	1650	8.2	8.0	4.5	75	9.1	70	130	23	17
26...	1242	4.1	--	--	5.5	7.0	--	--	--	--	--	--
MAY												
22...	1310	2.4	1750	8.3	24.0	18.0	100	7.6	80	150	29	20
JUN												
28...	1337	6.9	1340	7.9	35.0	25.0	240	2.1	25	120	21	16
AUG												
23...	1415	0.19	1190	8.3	30.0	23.5	60	7.4	87	200	47	21

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
OCT												
05...	270	82	11	5.0	523	170	17	0.30	39	852	859	1.16
DEC												
05...	480	86	16	8.1	780	340	31	0.40	38	1430	1420	1.94
JAN												
12...	300	88	14	5.3	535	190	18	0.20	42	924	906	1.26
FEB												
15...	300	87	14	5.0	553	190	17	0.30	41	938	917	1.28
MAR												
19...	340	85	13	7.9	615	260	30	0.20	30	1150	1080	1.56
APR												
03...	330	84	13	7.3	596	270	23	<0.10	29	1100	1060	1.50
MAY												
22...	380	83	13	7.5	670	320	28	0.30	22	1230	1210	1.67
JUN												
28...	270	82	11	6.9	484	240	19	0.10	28	928	892	1.26
AUG												
23...	210	68	6	5.5	544	120	15	0.50	31	748	777	1.02

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT												
05...	2.99	0.240	0.120	--	--	--	700	--	--	--	--	--
DEC												
05...	8.69	0.420	0.480	--	--	--	1100	--	--	--	--	--
JAN												
12...	2.99	0.190	0.240	--	--	--	820	--	--	--	--	--
FEB												
15...	2.91	0.200	0.160	--	--	--	820	--	--	--	--	--
MAR												
19...	13.1	0.150	0.540	50	3	44	860	<1.0	6	<3	<10	110
APR												
03...	9.59	0.100	0.600	--	--	--	860	--	--	--	--	--
MAY												
22...	8.07	0.200	0.530	--	--	--	1100	--	--	--	--	--
JUN												
28...	17.3	<0.100	0.750	--	--	--	970	--	--	--	--	--
AUG												
23...	0.38	<0.100	0.200	20	3	130	530	1.0	<1	1	1	40

DATE	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
MAR											
19...	<10	150	79	<0.1	<10	<10	<1	160	<6	8	<0.010
AUG											
23...	<1	82	36	0.1	2	1	<1	200	5	<3	<0.010
23...	<1	82	36	0.1	2	1	<1	200	5	<3	<0.010

05056000 SHEYENNE RIVER NEAR WARWICK, ND

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, Hydrologic Unit 09020203, on left bank on downstream side of county highway bridge, and 3.3 mi south of Warwick.

DRAINAGE AREA.--2,070 mi^2, approximately, of which about 1,310 mi^2 is probably noncontributing, including 227 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1438: 1952(M). WSP 1728: Drainage area.

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

REMARKS.--Estimated daily discharges: Nov. 1, 2, 21, 22, and Dec. 5 to Feb. 5. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--40 years, 54.8 ft^3/s, 39,700 acre-ft/yr; median of yearly mean discharges, 51 ft^3/s, 36,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,660 ft^3/s, Apr. 14, 1969, gage height, 7.51 ft; maximum gage height, 7.83 ft, Apr. 18, 1956; no flow Aug. 7 to Sept. 1, and Sept. 3-9, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 5	1030	*66	*2.52				

Minimum daily discharge, 0.30 ft^3/s, Dec. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.71	e1.9	3.8	e.50	e.50	.95	25	15	9.0	22	4.9	1.8
2	.75	e1.9	3.5	e.45	e.50	1.0	26	17	18	18	4.8	3.3
3	.80	1.9	3.3	e.45	e.55	1.0	28	19	28	16	4.8	4.1
4	.88	1.8	3.3	e.40	e.60	1.0	32	18	49	13	4.7	2.1
5	1.1	1.6	e3.3	e.35	e.70	1.0	30	15	60	12	4.5	3.0
6	.66	2.0	e3.2	e.35	.80	1.0	27	12	53	9.7	3.9	3.2
7	.59	3.3	e3.0	e.40	.90	1.2	22	8.4	44	9.3	3.7	1.6
8	.62	4.5	e2.6	e.40	.90	1.4	20	7.7	40	14	4.0	2.0
9	.74	4.8	e2.4	e.40	.90	2.0	23	8.2	33	10	3.9	2.6
10	.72	5.3	e2.2	e.50	.85	5.0	37	9.2	26	8.6	3.6	1.6
11	.91	4.6	e2.0	e.50	.80	7.0	37	9.2	26	8.7	3.8	1.3
12	.85	4.4	e1.8	e.50	.80	9.0	34	8.9	21	7.6	4.0	1.2
13	.80	4.4	e1.6	e.50	.80	8.0	33	8.1	21	6.4	3.5	2.0
14	.76	4.4	e1.3	e.50	.80	7.5	31	7.8	18	6.0	2.9	2.6
15	.84	4.3	e1.0	e.50	.80	7.2	28	7.8	18	6.3	3.1	1.9
16	.88	4.0	e.90	e.50	.80	7.0	30	8.5	18	6.0	3.5	1.5
17	.95	4.0	e.80	e.50	.80	6.8	26	6.6	17	6.4	3.6	1.5
18	1.2	3.7	e.70	e.50	.80	6.6	27	8.1	15	4.9	6.0	3.1
19	1.5	3.8	e.60	e.50	.75	6.5	26	11	17	4.8	4.9	2.8
20	1.6	3.8	e.50	e.50	.75	6.5	26	13	16	5.4	3.8	2.7
21	1.9	e3.8	e.40	e.50	.80	6.5	22	11	19	5.7	3.3	2.5
22	2.0	e3.7	e.35	e.50	.80	6.5	19	9.4	31	6.2	2.9	2.0
23	2.4	3.7	e.30	e.50	.80	6.0	18	8.7	36	6.7	3.0	2.0
24	2.0	3.7	e.40	e.50	.70	6.0	18	8.6	30	6.8	2.2	1.9
25	2.3	3.6	e.50	e.50	.70	5.5	21	9.0	24	6.2	4.0	1.7
26	2.3	3.6	e.50	e.50	.70	5.5	18	10	21	7.0	5.0	1.3
27	2.6	3.6	e.50	e.50	.70	5.5	16	9.8	19	7.7	4.2	1.3
28	1.0	3.6	e.45	e.50	.80	6.0	17	9.2	22	6.7	2.5	1.4
29	1.3	3.9	e.45	e.50	---	6.5	15	9.1	27	6.0	1.5	1.8
30	1.4	4.0	e.45	e.50	---	10	14	9.2	25	6.3	.98	1.9
31	1.9	---	e.45	e.50	---	17	---	8.9	---	5.3	1.5	---
TOTAL	38.96	107.6	46.55	14.70	21.10	168.65	746	321.4	801.0	265.7	112.98	63.7
MEAN	1.26	3.59	1.50	.47	.75	5.44	24.9	10.4	26.7	8.57	3.64	2.12
MAX	2.6	5.3	3.8	.50	.90	17	37	19	60	22	6.0	4.1
MIN	.59	1.6	.30	.35	.50	.95	14	6.6	9.0	4.8	.98	1.2
AC-FT	77	213	92	29	42	335	1480	637	1590	527	224	126

CAL YR 1989 TOTAL 7046.15 MEAN 19.3 MAX 662 MIN .17 AC-FT 13980
WTR YR 1990 TOTAL 2708.34 MEAN 7.42 MAX 60 MIN .30 AC-FT 5370

e Estimated

05056000 SHEYENNE RIVER NEAR WARWICK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1953, 1958 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
DEC												
06...	1200	3.2	770	--	-17.5	1.0	--	--	--	--	--	--
JAN												
29...	1230	0.47	520	--	1.0	2.0	--	--	--	--	--	--
FEB												
07...	1520	1.0	518	--	8.0	3.0	--	--	--	--	--	--
MAR												
20...	1105	6.6	715	--	1.0	1.5	--	--	--	--	--	--
APR												
02...	1545	25	662	7.7	3.0	3.5	280	65	29	29	18	0.8
MAY												
11...	1025	9.2	645	--	10.5	13.0	--	--	--	--	--	--
JUN												
21...	0950	17	770	--	18.0	20.0	--	--	--	--	--	--
AUG												
29...	0945	2.2	782	8.3	18.5	19.0	230	46	29	76	41	2

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	8.6	330	0	270	73	12	0.20	20	390	399	0.53
AUG											
29...	5.5	300	0	240	120	17	0.20	14	488	455	0.66

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	26.3	2	90	70	1	37	660	0.1	2	1	350
AUG											
29...	2.90	5	120	10	<1	49	60	0.1	1	<1	280

05056060 MAUVAIS COULEE TRIBUTARY NO. 3 NEAR CANDO, ND

LOCATION.--Lat 48°27'28, long 99°14'06", in $NW^1/_4NW^1/_4$ sec.6, T.157 N., R.66 W., Towner County, Hydrologic Unit 09020201, at bridge 2.1 mi south of Cando

DRAINAGE AREA.--60.2 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1955-71 (annual maximum discharges only), 1986-88 (discharge measurements only), March 1989 to current year (seasonal records only since 1989).

GAGE.--Nonrecording gage. Elevation of gage is 1,460 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair.

EXTREMES FOR CURRENT PERIOD.--No flow for entire period.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00

05056100 MAUVAIS COULEE NEAR CANDO, ND

LOCATION.--Lat 48°26'53", long 99°06'08", in $SE^1/_4NE^1/_4SE^1/_4$ sec.1, T.157 N., R.66 W., Towner County, Hydrologic Unit 09020201, on left bank 0.3 mi upstream from highway bridge, about 4 mi upstream from West Fork, 5.5 mi southeast of Cando, and 7 mi northeast of Maza.

DRAINAGE AREA.--387 mi^2, of which about 10 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1956 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Elevation of gage is 1,445 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 2, 1957, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Apr. 1-12. Records good except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--26 years (water years 1957-82), 19.2 ft^3/s, 13,910 acre-ft/yr; median of yearly mean discharges, 13 ft^3/s, 9,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,660 ft^3/s, Apr. 25, 1979, gage height, 11.18 ft; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period March to September, 0.10 ft^3/s, Apr. 5, gage height, 2.16; no flow Mar. 1-31, Apr. 13 to June 4, and June 14 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	e.02	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	e.04	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	e.05	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	e.06	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	e.07	.00	.01	.00	.00	.00
6	---	---	---	---	---	.00	e.04	.00	.02	.00	.00	.00
7	---	---	---	---	---	.00	e.03	.00	.02	.00	.00	.00
8	---	---	---	---	---	.00	e.02	.00	.03	.00	.00	.00
9	---	---	---	---	---	.00	e.02	.00	.02	.00	.00	.00
10	---	---	---	---	---	.00	e.04	.00	.01	.00	.00	.00
11	---	---	---	---	---	.00	e.02	.00	.01	.00	.00	.00
12	---	---	---	---	---	.00	e.01	.00	.01	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.01	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.42	0.00	0.14	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.014	.000	.005	.000	.000	.000
MAX	---	---	---	---	---	.00	.07	.00	.03	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	.8	.00	.3	.00	.00	.00

e Estimated

05056100 MAUVAIS COULEE NEAR CANDO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
APR 10...	1255	0.05	390	7.3	3.0	2.0	5.6	40	140	31

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
APR 10...	16	14	17	0.5	6.8	90	0	74	96	9.7

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR 10...	0.10	4.2	223	223	0.30	0.03	0.90	0.200	0.100	2

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 10...	10	60	<1	19	640	0.1	<1	<1	240

05056200 EDMORE COULEE NEAR EDMORE, ND

LOCATION.--Lat 48°20'14, long 98°39'33", in $NW^1/_4NW^1/_4$ sec.17, T.156 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on right bank 50 ft upstream from bridge on county highway, 11 mi southwest of Edmore, and about 13 mi upstream from Sweetwater Lake.

DRAINAGE AREA.--382 mi^2, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1956, June 1957 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929. June 26, 1957, to Sept. 30, 1985, water-stage recorder at same site at a datum of 1,479.79 ft above National Geodetic Vertical Datum of 1929. Prior to June 26, 1957, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Apr. 1-8. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--25 years (1957-82), 13.3 ft^3/s, 9,640 acre-ft/yr; median of yearly mean discharges, 9.2 ft^3/s, 6,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,110 ft^3/s, Apr. 25, 1979, gage height, 87.10 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 3.5 ft^3/s, Apr. 4, gage height, unknown; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	e.01	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	e.25	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	e1.8	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	e2.2	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	e.50	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	e.10	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	e.02	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	e.01	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	4.89	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.16	.000	.000	.000	.000	.000
MAX	---	---	---	---	---	.00	2.2	.00	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	9.7	.00	.00	.00	.00	.00

e Estimated

05056200 EDMORE COULEE NEAR EDMORE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
APR 02...	1240	0.12	258	7.1	2.0	0.5	7.7	53	96	26	7.5

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
APR 02...	6.0	11	0.3	10	79	0	64	50	8.8	0.10	7.5

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS HYDRO. + ORTHO DIS. (MG/L AS P) (00677)
APR 02...	170	159	0.23	0.05	0.660	0.170	1.4	0.280	0.210	0.30

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 02...	1	30	120	1	6	100	0.1	1	<1	160

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND

LOCATION.--Lat 48°15'59", long 98°40'50", in $NW^1/_4NW^1/_4$ sec.7, T.155 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on upstream side of bridge on county road, 9 mi east and 1.1 mi south of Webster.

DRAINAGE AREA.--148 mi^2, approximately, of which about 44 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal). Discharge record available for 1986 water year in files of the District office.

GAGE.--Water-stage recorder. Datum of gage is 1400.00 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to October 1986 nonrecording gage at present site and datum.

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 739 ft^3/s, Apr. 9, 1987, gage height, 72.48 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1959 reached a stage of about 75.00 ft, from conversation with local residents.

EXTREMES FOR CURRENT YEAR.--No flow for entire period.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00

05056222 MORRISON LAKE NEAR WEBSTER, ND

LOCATION.--Lat 48°15'35", long 98°50'48", in NW¼ sec.11, T.155 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on northwest shoreline of Morrison Lake.

DRAINAGE AREA.--501 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Stage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 62.02 ft, Apr. 13, 1987; minimum recorded, 54.47 ft, Sept. 24, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 56.19 ft, June 19; minimum recorded, 54.47 ft, Sept. 24.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55.95	55.70	55.75	---	---	---	---	55.62	55.83	55.88	55.34	54.85
2	55.98	55.70	55.76	---	---	---	---	55.65	55.74	55.87	55.28	54.88
3	55.99	55.70	55.76	---	---	---	---	55.69	55.92	55.83	55.26	54.91
4	55.94	55.70	55.76	---	---	---	---	55.65	55.97	55.79	55.23	54.83
5	55.93	55.71	55.76	---	---	---	---	55.66	55.91	55.80	55.24	54.83
6	55.94	55.71	55.74	---	---	---	---	55.72	55.95	55.85	55.23	54.82
7	55.94	55.70	55.68	---	---	---	---	55.67	55.95	55.80	55.21	54.80
8	55.90	55.69	55.59	---	---	---	---	55.69	55.92	55.80	55.17	54.80
9	55.93	55.69	55.55	---	---	---	---	55.69	55.96	55.80	55.15	54.77
10	55.89	55.70	55.54	---	---	---	---	55.73	55.98	55.82	55.12	54.75
11	55.91	55.67	55.47	---	---	---	---	55.74	56.01	55.79	55.12	54.77
12	55.90	55.73	---	---	---	---	---	55.77	56.00	55.78	55.11	54.73
13	55.88	55.75	---	---	---	---	---	55.78	56.02	55.81	55.11	54.75
14	55.85	55.75	---	---	---	---	---	55.77	56.00	55.83	55.07	54.66
15	55.84	55.75	---	---	---	---	---	55.82	55.95	55.83	55.08	54.67
16	55.85	55.75	---	---	---	---	---	55.69	55.93	55.81	55.05	54.66
17	55.85	55.75	---	---	---	---	---	55.65	56.00	55.60	55.01	54.72
18	55.84	55.75	---	---	---	---	---	55.78	56.03	---	54.98	54.67
19	55.84	55.74	---	---	---	---	---	55.80	56.05	---	54.98	54.66
20	55.84	55.74	---	---	---	---	---	55.78	56.03	---	54.97	54.67
21	55.82	55.74	---	---	---	---	---	55.77	56.03	---	54.98	54.62
22	55.83	55.74	---	---	---	---	---	55.72	56.01	---	54.97	54.58
23	55.83	55.74	---	---	---	---	---	55.74	56.01	---	55.02	54.62
24	55.82	55.74	---	---	---	---	---	55.76	55.98	---	54.95	54.61
25	55.80	55.74	---	---	---	---	---	55.74	55.99	55.46	54.98	54.60
26	55.87	55.74	---	---	---	---	---	55.74	55.99	55.46	54.99	54.60
27	55.71	55.74	---	---	---	---	---	55.75	55.94	55.43	54.99	54.58
28	55.75	55.74	---	---	---	---	---	55.74	55.89	55.37	54.97	54.61
29	55.73	55.74	---	---	---	---	---	55.75	55.88	55.34	54.93	54.91
30	55.73	55.74	---	---	---	---	---	55.76	55.87	55.34	54.93	54.99
31	55.72	---	---	---	---	---	---	55.82	---	55.35	54.93	---
MEAN	55.86	55.73	---	---	---	---	---	55.73	55.96	---	55.08	54.73
MAX	55.99	55.75	---	---	---	---	---	55.82	56.05	---	55.34	54.99
MIN	55.71	55.67	---	---	---	---	---	55.62	55.74	---	54.93	54.58

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND

LOCATION.--Lat 48°19'13", long 98°56'23", in NW¼SW¼NW¼ sec.19, T.156 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on right bank 3.8 mi northwest of Webster.

DRAINAGE AREA.--About 310 mi², of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to current year (seasonal records only since 1988).

GAGE.--Water-stage recorder. Elevation of gage is 1,448.00 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 23, 1986, nonrecording gage 100 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Apr. 1-9. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--8 years (water years 1980-87), 11.1 ft³/s, 8,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 570 ft³/s, Apr. 11, 1987, gage height, 8.50 ft; maximum gage height, 10.05 ft, Apr. 6, 1989, backwater from ice; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 150 ft³/s, Apr. 9, gage height, 6.53 ft, backwater from ice; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	e.00	.08	.00	.04	.00	.00
2	---	---	---	---	---	.00	e.00	.20	.00	.03	.00	.00
3	---	---	---	---	---	.00	e.00	.20	.00	.02	.00	.00
4	---	---	---	---	---	.00	e.00	.17	.00	.00	.00	.00
5	---	---	---	---	---	.00	e.25	.15	.00	.00	.00	.00
6	---	---	---	---	---	.00	e1.0	.14	.00	.00	.00	.00
7	---	---	---	---	---	.00	e3.0	.09	.00	.00	.00	.00
8	---	---	---	---	---	.00	e25	.03	.00	.00	.00	.00
9	---	---	---	---	---	.00	e40	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	23	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	17	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	14	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	9.8	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	9.6	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	11	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	11	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	7.6	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	4.3	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	2.1	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	1.3	.00	.41	.00	.00	.00
21	---	---	---	---	---	.00	.49	.00	.70	.00	.00	.00
22	---	---	---	---	---	.00	.71	.00	.41	.00	.00	.00
23	---	---	---	---	---	.00	.57	.00	.22	.00	.00	.00
24	---	---	---	---	---	.00	.24	.00	.15	.00	.00	.00
25	---	---	---	---	---	.00	.16	.00	.11	.00	.00	.00
26	---	---	---	---	---	.00	.25	.00	.05	.00	.00	.00
27	---	---	---	---	---	.00	.35	.00	.06	.00	.00	.00
28	---	---	---	---	---	.00	.21	.00	.13	.00	.00	.00
29	---	---	---	---	---	.00	.10	.00	.34	.00	.00	.00
30	---	---	---	---	---	.00	.15	.00	.07	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	183.18	1.06	2.65	0.09	0.00	0.00
MEAN	---	---	---	---	---	.000	6.11	.034	.088	.003	.000	.000
MAX	---	---	---	---	---	.00	40	.20	.70	.04	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	363	2.1	5.3	.2	.00	.00

e Estimated

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
APR										
10...	1535	22	445	7.9	0.5	2.5	12.0	86	160	41
19...	1140	2.0	455	8.2	9.0	8.5	10.0	88	180	46
JUN										
20...	1530	0.70	512	8.4	23.0	24.0	12.2	144	210	48

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
APR										
10...	15	14	14	0.5	13	130	0	110	80	13
19...	16	13	13	0.4	13	190	0	160	58	8.7
JUN										
20...	22	19	16	0.6	9.4	230	0	187	65	12

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
10...	0.10	19	292	263	0.40	17.2	0.60	0.640	0.510	6
19...	0.10	27	292	277	0.40	1.58	1.40	--	--	8
JUN										
20...	0.20	22	317	310	0.43	0.60	1.60	0.060	0.080	7

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
10...	30	170	1	13	30	0.1	2	<1	230
19...	40	40	<1	14	10	0.1	2	<1	240
JUN									
20...	50	20	<1	21	10	<0.1	<1	<1	230

05056241 DRY LAKE NEAR PENN, ND

LOCATION.--Lat 48°13'52", long 98°58'59", in $NW^1/_4NW^1/_4SW^1/_4$ sec.23, T.155 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on west shoreline of Dry Lake, 6 mi east of Penn.

DRAINAGE AREA.--920 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1983 to present (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Stage affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 50.32 ft, Apr. 20, 1987, affected by wind; minimum recorded, 42.48 ft, May 13, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 45.02 ft, June 2, affected by wind; minimum recorded, 42.48 ft, May 13.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44.33	---	---	---	---	---	---	43.69	42.63	44.02	43.50	43.18
2	43.91	---	---	---	---	---	---	43.68	44.02	44.02	43.49	43.17
3	43.69	---	---	---	---	---	---	43.65	44.62	44.01	43.47	43.17
4	43.62	---	---	---	---	---	---	43.63	44.59	43.98	43.44	43.15
5	43.76	---	---	---	---	---	---	43.59	44.55	43.96	43.43	43.13
6	---	---	---	---	---	---	---	43.58	44.51	43.93	43.42	43.13
7	---	---	---	---	---	---	---	43.57	44.47	43.92	43.42	43.12
8	---	---	---	---	---	---	---	43.80	44.46	43.91	43.41	43.10
9	---	---	---	---	---	---	---	44.31	44.43	43.90	43.39	43.09
10	---	---	---	---	---	---	---	43.74	44.39	43.89	43.37	43.07
11	---	---	---	---	---	---	---	43.06	44.34	43.88	43.36	43.06
12	---	---	---	---	---	---	---	42.66	44.32	43.85	43.35	43.05
13	---	---	---	---	---	---	---	43.03	44.28	43.84	43.34	43.04
14	---	---	---	---	---	---	---	43.81	44.26	43.82	43.34	43.02
15	---	---	---	---	---	---	---	43.03	44.23	43.81	43.33	43.01
16	---	---	---	---	---	---	---	43.71	44.24	43.78	43.33	42.99
17	---	---	---	---	---	---	---	44.25	44.25	43.78	43.31	42.98
18	---	---	---	---	---	---	---	44.24	44.20	43.74	43.30	42.97
19	---	---	---	---	---	---	---	43.90	44.19	43.72	43.28	42.96
20	---	---	---	---	---	---	---	43.55	44.18	43.70	43.27	42.95
21	---	---	---	---	---	---	---	43.30	44.17	43.68	43.26	42.94
22	---	---	---	---	---	---	---	43.14	44.14	43.66	43.25	42.92
23	---	---	---	---	---	---	---	43.01	44.14	43.64	43.25	42.91
24	---	---	---	---	---	---	---	42.90	44.12	43.63	43.23	42.91
25	---	---	---	---	---	---	---	42.82	44.10	43.61	43.26	42.90
26	---	---	---	---	---	---	---	42.79	44.08	43.60	43.26	42.89
27	---	---	---	---	---	---	---	42.80	44.08	43.59	43.25	42.87
28	---	---	---	---	---	---	---	42.78	44.07	43.56	43.24	42.86
29	---	---	---	---	---	---	---	42.75	44.06	43.54	43.22	42.86
30	---	---	---	---	---	---	---	42.72	44.03	43.51	43.21	42.85
31	---	---	---	---	---	---	---	42.67	---	43.50	43.21	---
MEAN	---	---	---	---	---	---	---	43.36	44.20	43.77	43.33	43.01
MAX	---	---	---	---	---	---	---	44.31	44.62	44.02	43.50	43.18
MIN	---	---	---	---	---	---	---	42.66	42.63	43.50	43.21	42.85

05056390 LITTLE COULEE NEAR BRINSMADE, ND

LOCATION.--Lat 48°11'15", long 99°14'34", in SW¼ sec.2, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on right bank 100 ft downstream from bridge on township road, 0.5 mi downstream from Silver Lake, and 4 mi east of Brinsmade.

DRAINAGE AREA.--350 mi², of which about 160 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Elevation of gage is 1,435 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--7 years (water years 1976-82), 7.02 ft³/s, 5,090 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 425 ft³/s, May 1, 1979, gage height, 10.43 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--No flow for entire period.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00

05056400 BIG COULEE NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°10'40", long 99°13'15", in NW¼NW¼ sec.12, T. 154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on left bank on downstream side of bridge on U.S. Highway 281, 1 mi downstream from Little Coulee, and 6 mi south of Churchs Ferry.

DRAINAGE AREA.--1,620 mi², approximately, of which about 158 mi² is probably noncontributing (revised). Drainage area reduced from approximately 2,510 mi² with the completion of Channel A in March 1979.

WATER-DISCHARGE RECORDS

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 National Geodetic Vertical Datum of 1929. 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 mi upstream at datum 0.70 ft higher.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--12 years (water years 1979-90), 37.0 ft³/s, 26,810 acre-ft/yr; median of yearly mean discharges, 12 ft³/s, 9,100 acre-ft/yr. Twenty-eight years prior to construction of Channel A (water years 1951-78), 37.3 ft³/s, 27,020 acre-ft/yr; median of yearly mean discharges (1951-78), 7.8 ft³/s, 5,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,420 ft³/s, May 6, 1979, gage height, 7.59 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--No flow for entire period.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1989 TOTAL 118.58 MEAN .32 MAX 16 MIN .00 AC-FT 235
WTR YR 1990 TOTAL 0.00 MEAN .000 MAX .00 MIN .00 AC-FT .00

05056410 CHANNEL A NEAR PENN, ND

LOCATION.--Lat 48°10'00", long 98°58'47", in $SE^1/_4SW^1/_4SW^1/_4$ sec.11, T.154 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on right bank 200 ft upstream from U.S. Highway 2, 9 mi northwest of Devils Lake and 7 mi southeast of Penn.

DRAINAGE AREA.--930 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1985, water-stage recorder at same site at datum of 1,437.31 ft.

REMARKS.--Estimated daily discharges: Oct. 19 to Apr. 8. Records fair. Flow regulated by gate control on Dry Lake (station 05056241) 3 mi upstream.

AVERAGE DISCHARGE.--7 years (water years 1984-1990), 19.5 ft^3/s, 14,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,090 ft^3/s, Apr. 20, 1987, gage height, 42.87 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.1 ft^3/s, Apr. 3, gage height, 38.33 ft, backwater from ice; maximum gage height, 38.64 ft, Apr. 11, backwater from ice; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	e.01	e.01	e.00	e.00	e.00	e.20	.01	.01	.05	.01	.01
2	.01	e.01	e.01	e.00	e.00	e.00	e.50	.01	.32	.11	.01	.01
3	.01	e.01	e.01	e.00	e.00	e.00	e.81	.01	1.7	.05	.01	.01
4	.01	e.01	e.01	e.00	e.00	e.00	e.25	.01	.59	.05	.01	.01
5	.01	e.01	e.01	e.00	e.00	e.00	e.24	.02	.23	.05	.01	.01
6	.01	e.01	e.01	e.00	e.00	e.00	e.23	.02	.05	.05	.01	.01
7	.01	e.01	e.01	e.00	e.00	e.00	e.22	.14	.02	.05	.01	.01
8	.01	e.01	e.01	e.00	e.00	e.00	e.60	.05	.04	.05	.01	.01
9	.01	e.01	e.01	e.00	e.00	e.00	.81	.02	.03	.05	.01	.01
10	.01	e.01	e.01	e.00	e.00	e.00	.39	.03	.01	.05	.01	.01
11	.01	e.01	e.01	e.00	e.00	e.00	.56	.07	.02	.19	.01	.01
12	.01	e.01	e.01	e.00	e.00	e.00	1.2	.01	.07	.19	.01	.01
13	.01	e.01	e.01	e.00	e.00	e.00	.71	.07	.05	.19	.01	.01
14	.01	e.01	e.01	e.00	e.00	e.00	.46	.01	.01	.19	.01	.01
15	.01	e.01	e.01	e.00	e.00	e.00	.43	.01	.01	.19	.01	.01
16	.01	e.01	e.00	e.00	e.00	e.00	.37	.22	.01	.19	.01	.01
17	.01	e.01	e.00	e.00	e.00	e.00	.17	.13	.47	.19	.01	.01
18	.01	e.01	e.00	e.00	e.00	e.00	.16	.04	.34	.19	.01	.01
19	e.01	e.01	e.00	e.00	e.00	e.00	.40	.05	.42	.19	.01	.01
20	e.01	e.01	e.00	e.00	e.00	e.00	.28	.05	.46	.19	.01	.01
21	e.01	e.01	e.00	e.00	e.00	e.00	.28	.03	.23	.11	.01	.04
22	e.01	e.01	e.00	e.00	e.00	e.00	.16	.03	.17	.19	.01	.12
23	e.01	e.01	e.00	e.00	e.00	e.00	.07	.01	.19	.19	.01	.02
24	e.01	e.01	e.00	e.00	e.00	e.00	.02	.01	.26	.19	.01	.19
25	e.01	e.01	e.00	e.00	e.00	e.00	.02	.01	.14	.19	.01	.17
26	e.01	e.01	e.00	e.00	e.00	e.00	.01	.10	.10	.21	.01	.28
27	e.01	e.01	e.00	e.00	e.00	e.00	.01	.19	.05	.10	.25	.12
28	e.01	e.01	e.00	e.00	e.00	e.00	.01	.10	.05	.01	.20	.14
29	e.01	e.01	e.00	e.00	---	e.00	.03	.02	.05	.01	.28	.32
30	e.01	e.01	e.00	e.00	---	e.00	.02	.01	.10	.01	.10	.31
31	e.01	---	e.00	e.00	---	e.00	---	.02	---	.01	.01	---
TOTAL	0.31	0.30	0.15	0.00	0.00	0.00	9.62	1.51	6.20	3.68	1.10	1.91
MEAN	.010	.010	.005	.000	.000	.000	.32	.049	.21	.12	.035	.064
MAX	.01	.01	.01	.00	.00	.00	1.2	.22	1.7	.21	.28	.32
MIN	.01	.01	.00	.00	.00	.00	.01	.01	.01	.01	.01	.01
AC-FT	.6	.6	.3	.00	.00	.00	19	3.0	12	7.3	2.2	3.8

CAL YR 1989 TOTAL 203.71 MEAN .56 MAX 43 MIN .00 AC-FT 404
WTR YR 1990 TOTAL 24.78 MEAN .068 MAX 1.7 MIN .00 AC-FT 49

e Estimated

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE: October 1983 to September 1987 and April 1989 to current year.
WATER TEMPERATURE: October 1983 to September 1987 and April 1989 to current year.

INSTRUMENTATION.--Water-quality monitor from October 1983 to September 1987 and April 1989 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 2,880 microsiemens, June 9, 1984; minimum, 230 microsiemens, Apr. 16, 1984.
WATER TEMPERATURE: Maximum recorded, 32.6 °C, Aug. 1, 1987; minimum recorded, 0.0 °C on many days.

REMARKS.--Due to recorder malfunction, no water temperature or specific conductance data are available during the 1990 water year periods of flow.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)
DEC											
06...	0855	0.01	2280	--	-18.0	0.0	--	--	--	--	--
APR											
03...	0845	1.1	1590	7.8	2.0	1.0	13.1	92	500	120	49
11...	1100	0.20	2040	8.1	0.5	1.5	8.8	62	640	150	64
19...	0945	0.20	2950	8.3	8.0	7.5	9.6	83	880	170	110
MAY											
11...	0745	0.04	3300	--	10.0	9.5	--	--	--	--	--
JUN											
19...	1145	0.66	2020	--	18.0	21.5	--	--	--	--	--
AUG											
22...	1220	0.01	3220	--	26.0	26.5	--	--	--	--	--

DATE	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE, FET-LAB (MG/L AS HCO3) (95440)	CARBONATE, FET-LAB (MG/L AS CO3) (95445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)
APR											
03...	150	38	3	17	270	0	220	600	26	0.10	15
11...	210	41	4	17	340	0	280	770	38	0.10	17
19...	360	46	5	22	400	0	330	1200	96	0.10	13

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	PHOSPHORUS HYDRO. + ORTHO DIS. (MG/L AS P) (00677)
APR										
03...	1130	1110	1.54	3.36	0.300	0.040	1.0	0.100	0.020	0.05
11...	1480	1430	2.01	0.80	0.010	0.020	0.70	0.110	0.020	0.03
19...	2300	2170	3.13	1.24	0.010	0.020	1.3	--	--	0.03

DATE	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
APR										
03...	7	300	90	<1	110	820	0.1	5	<1	750
11...	8	360	70	1	140	460	0.2	4	<1	890
19...	7	480	40	<1	210	60	0.1	3	<1	1100

05056500 DEVILS LAKE NEAR DEVILS LAKE, ND

LOCATION.--Lat 48°04'00", long 98°56'07", in SW$^1/_4$ sec.18, T.153 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, at Lakewood, on east bank of Creel Bay, 4.5 mi southwest of city of Devils Lake. Creel Bay, which is 0.5 mi wide, is an arm of Devils Lake and extends 2 mi to the north of the lake.

DRAINAGE AREA.--3,130 mi^2, approximately, of which about 1,000 mi^2 is probably noncontributing.

GAGE-HEIGHT RECORDS

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

REVISED RECORDS.--WSP 1913: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929; gage readings have been reduced to elevations NGVD. 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. Prior to October 1979 only monthend elevations were published.

REMARKS.--Elevation at gage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,438.40 ft in 1867, present datum; minimum observed, 1,400.87 ft, Oct. 24, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--The lake level was at an elevation of about 1,441 ft around 1830 and lower thereafter. Reference is Geological Survey monograph, volume XXV, the Glacial History of Lake Agassiz by Warren Upham.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,425.07 ft, Oct. 1; minimum, 1,423.71 ft, Sept. 28-30.

MONTHEND ELEVATION, IN FEET, AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Oct. 31	1,424.77	Jan. 31	--	Apr. 30	1,424.81	July 31	1,424.42
Nov. 30	1,424.72	Feb. 28	1,424.57	May 31	1,424.53	Aug. 31	1,424.13
Dec. 31	1,424.68	Mar. 31	1,424.81	June 30	1,424.76	Sept.30	1,423.75

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.03	24.77	24.71	24.69	---	24.56	24.81	24.77	24.54	24.78	24.43	24.07
2	25.00	24.77	24.71	24.69	---	---	24.81	24.66	24.59	24.80	24.46	24.02
3	25.01	24.77	24.72	24.70	---	---	24.81	24.63	24.69	24.83	24.44	24.05
4	24.99	24.80	24.73	24.69	---	---	24.78	24.68	24.66	24.80	24.41	24.02
5	25.00	24.80	24.74	24.69	---	---	24.79	24.69	24.73	24.71	24.38	24.02
6	24.99	24.80	24.71	24.69	24.60	---	24.81	24.68	24.68	24.65	24.37	24.01
7	24.99	24.80	24.70	24.70	24.65	---	24.81	24.68	24.65	24.68	24.34	23.99
8	24.99	24.79	24.70	24.70	24.66	---	24.81	24.67	24.74	24.73	24.32	23.98
9	24.99	24.79	24.70	24.69	24.64	---	24.80	24.62	24.67	24.70	24.31	23.93
10	24.96	24.79	24.69	24.70	24.63	---	24.80	24.65	24.64	24.69	24.27	23.89
11	24.97	24.80	24.69	24.69	24.65	---	24.80	24.63	24.65	24.71	24.25	23.88
12	24.96	24.77	24.69	24.67	24.63	---	24.80	24.62	24.68	24.72	24.26	23.85
13	24.95	24.74	24.68	24.72	24.59	---	24.80	24.60	24.71	24.69	24.25	23.92
14	24.95	24.75	24.67	24.69	24.59	---	24.79	24.61	24.66	24.66	24.23	23.92
15	24.94	24.75	24.67	---	24.59	---	24.80	24.58	24.65	24.66	24.21	23.86
16	24.94	24.71	24.68	---	24.58	---	24.80	24.70	24.66	24.63	24.21	23.84
17	24.92	24.74	24.68	---	24.56	---	24.79	24.65	24.78	24.66	24.13	23.83
18	24.89	24.73	24.67	---	24.57	---	24.78	24.59	24.83	24.62	24.11	23.88
19	24.88	24.74	24.66	---	24.55	---	24.80	24.59	24.86	24.62	24.13	23.86
20	24.88	24.75	24.67	---	24.54	24.73	24.80	24.59	24.84	24.62	24.14	23.85
21	24.88	24.75	24.66	---	24.56	24.72	24.72	24.60	24.82	24.59	24.13	23.85
22	24.88	---	24.66	---	24.59	24.74	24.65	24.62	24.80	24.58	24.11	23.80
23	24.88	---	24.67	---	24.50	24.77	24.69	24.60	24.79	24.58	24.13	23.79
24	24.88	---	24.69	---	24.50	24.77	24.76	24.57	24.78	24.56	24.11	23.80
25	24.88	---	24.69	---	24.49	24.77	24.79	24.55	24.79	24.54	24.19	23.78
26	24.88	---	24.69	---	24.52	24.76	24.77	24.57	24.79	24.54	24.15	23.76
27	24.91	---	24.70	---	24.50	24.77	24.75	24.60	24.79	24.54	24.18	23.75
28	24.84	---	24.70	---	24.50	24.77	24.82	24.58	24.82	24.55	24.17	23.73
29	24.80	24.72	24.69	---	---	24.77	24.81	24.56	24.83	24.48	24.13	23.73
30	24.83	24.73	24.69	---	---	24.77	24.82	24.56	24.79	24.47	24.11	23.75
31	24.77	---	24.70	---	---	24.80	---	24.55	---	24.45	24.12	---
MEAN	24.92	---	24.69	---	---	---	24.79	24.62	24.73	24.64	24.23	23.88
MAX	25.03	---	24.74	---	---	---	24.82	24.77	24.86	24.83	24.46	24.07
MIN	24.77	---	24.66	---	---	---	24.65	24.55	24.54	24.45	24.11	23.73

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND

LOCATION.--Lat 47°25'58", long 98°01'38", in $NW^1/_4NW^1/_4SW^1/_4$ sec.26, T.146 N., R.58 W., Griggs County, Hydrologic Unit 09020203, on right bank at Ueland Dam, 0.7 mi downstream from State Highway 200, and 5 mi east of Cooperstown.

DRAINAGE AREA.--6,470 mi^2, approximately, of which about 5,200 mi^2 is probably noncontributing, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area. WRD ND-80-1: Gage datum.

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,271.76 ft above National Geodetic Vertical Datum of 1929, Coast and Geodetic Survey benchmark. Aug. 31, 1950, to Oct. 22, 1985, gage located on right bank 300 ft downstream of present site and datum. Prior to Aug. 3, 1950, nonrecording gage at site 150 ft downstream of present site at same datum.

REMARKS.--Estimated daily discharges: Oct. 2-4, Nov. 11-17, and Dec. 8 to Mar. 17. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--46 years, 106 ft^3/s, 76,800 acre-ft/yr; median of yearly mean discharges, 84 ft^3/s, 60,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,830 ft^3/s, Apr. 17, 1950, gage height, 18.69 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 30	1115	*159	*10.30	No other peak greater than base discharge.			

No flow, Dec. 21-23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.90	10	11	e2.2	e3.5	e3.0	26	51	29	135	16	13
2	e.30	9.9	11	e2.2	e3.0	e3.0	38	51	31	98	16	12
3	e.10	5.8	11	e2.2	e4.5	e3.5	42	51	40	73	14	11
4	e.10	5.9	11	e2.2	e6.0	e3.5	49	50	48	67	13	11
5	.22	6.6	11	e2.2	e6.0	e3.5	55	48	56	69	13	11
6	.85	9.5	9.2	e2.5	e11	e3.7	57	46	66	69	13	11
7	.67	9.2	7.5	e3.0	e11	e3.8	71	45	67	62	13	11
8	.82	11	e7.5	e4.0	e12	e3.9	73	43	71	56	13	11
9	1.4	11	e7.0	e5.5	e11	e4.0	79	42	75	51	12	9.8
10	.58	12	e6.0	e7.5	e10	e6.0	83	41	76	46	13	8.4
11	.96	e12	e5.0	e7.0	e10	e7.5	83	41	82	41	12	8.3
12	3.1	e12	e4.0	e6.5	e9.0	e10	84	40	114	36	14	6.4
13	6.0	e12	e3.5	e6.0	e8.0	e8.0	92	40	111	33	12	6.2
14	7.8	e12	e2.5	e6.0	e7.0	e8.0	97	39	119	32	15	6.1
15	8.4	e12	e2.0	e6.0	e5.0	e8.0	97	37	104	33	15	5.0
16	12	e11	e1.5	e6.0	e4.5	e8.0	90	35	85	30	16	3.9
17	7.9	e11	e.60	e6.0	e4.0	e8.5	88	33	73	30	15	3.3
18	5.6	11	e.30	e6.0	e4.0	e10	81	34	67	29	15	6.1
19	7.8	12	e.20	e6.0	e4.0	11	78	33	67	28	16	4.0
20	6.8	13	e.00	e6.0	e4.0	7.5	73	33	87	27	15	4.9
21	4.6	13	e.00	e6.0	e4.5	7.3	77	34	109	25	12	5.3
22	4.7	13	e.00	e9.0	e5.0	7.3	80	34	106	23	11	2.7
23	4.7	12	e.10	e10	e3.0	11	74	36	88	21	12	2.8
24	7.1	14	e.50	e10	e3.0	10	66	35	71	21	12	5.4
25	5.1	13	e.80	e10	e2.5	10	61	32	62	21	13	4.0
26	6.4	13	e1.5	e10	e2.0	9.6	58	31	53	19	17	2.6
27	5.3	12	e2.5	e10	e2.0	11	58	30	50	18	13	2.0
28	5.5	11	e2.4	e10	e2.5	11	62	31	52	18	11	2.0
29	8.6	12	e2.0	e10	---	11	59	32	92	17	12	2.0
30	3.1	12	e2.0	e7.0	---	11	53	31	154	17	12	1.1
31	8.5	---	e2.0	e4.0	---	19	---	30	---	17	13	---
TOTAL	135.90	333.9	125.60	191.0	162.0	242.6	2084	1189	2305	1262	419	193.3
MEAN	4.38	11.1	4.05	6.16	5.79	7.83	69.5	38.4	76.8	40.7	13.5	6.44
MAX	12	14	11	10	12	19	97	51	154	135	17	13
MIN	.10	5.8	.00	2.2	2.0	3.0	26	30	29	17	11	1.1
AC-FT	270	662	249	379	321	481	4130	2360	4570	2500	831	383

CAL YR 1989 TOTAL 14170.10 MEAN 38.8 MAX 781 MIN .00 AC-FT 28110
WTR YR 1990 TOTAL 8643.30 MEAN 23.7 MAX 154 MIN .00 AC-FT 17140

e Estimated

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
11...	1250	1.2	990	--	12.0	9.5	--	--	--	--	--	--
NOV												
21...	1300	12	910	--	-1.0	2.0	--	--	--	--	--	--
JAN												
04...	1355	2.2	1040	--	-10.0	1.0	--	--	--	--	--	--
MAR												
07...	0940	3.8	1060	--	-1.0	1.0	--	--	--	--	--	--
27...	1440	11	632	--	2.0	1.5	--	--	--	--	--	--
30...	1055	11	648	7.9	8.0	4.0	220	54	20	44	30	1
MAY												
03...	0955	51	450	--	17.0	10.0	--	--	--	--	--	--
JUN												
26...	0905	54	830	--	26.0	24.0	--	--	--	--	--	--
AUG												
08...	1255	12	772	8.4	26.0	24.5	290	64	32	55	29	1
SEP												
25...	1015	4.0	805	--	17.5	13.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	6.5	250	0	200	100	12	0.10	15	372	376	0.51
AUG											
08...	6.3	380	0	308	110	14	0.20	21	514	488	0.70

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
30...	11.2	2	100	30	<1	32	1900	0.2	2	<1	350
AUG											
08...	17.2	4	130	20	1	53	600	0.1	<1	<1	410

05057200 BALDHILL CREEK NEAR DAZEY, ND

LOCATION.--Lat 47°13'45", long 98°07'28", in NW¼SE¼SW¼ sec.2, T.143 N., R.59 W., Barnes County, Hydrologic Unit 09020203, on left bank 500 ft upstream from bridge on county highway, 4.5 mi northeast of Dazey, and 14 mi upstream from mouth.

DRAINAGE AREA.--691 mi², of which about 340 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

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

REMARKS.--Estimated daily discharges: Oct. 1 to May 22 and Aug. 25 to Sept. 27. Records good except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--34 years, 15.5 ft³/s, 11,230 acre-ft/yr; median of yearly mean discharges, 12 ft³/s, 8,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 9,000 ft³/s, Apr. 19, 1979, on basis of contracted opening measurement of peak flow at site 4.5 mi downstream, gage height, 17.78 ft, from floodmark; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 13	0015	*32	*6.67				

No flow Dec. 12 to Feb. 19 and Aug. 14-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.1	e1.0	e2.5	e.00	e.00	e.30	e7.6	e4.5	1.0	17	1.0	e.20
2	e1.1	e1.0	e2.5	e.00	e.00	e.50	e8.6	e4.0	4.4	19	.99	e.19
3	e1.1	e1.5	e2.5	e.00	e.00	e.65	e9.5	e3.6	11	18	.77	e.18
4	e1.1	e2.0	e2.4	e.00	e.00	e.80	e10	e3.4	7.4	16	.59	e.17
5	e1.2	e2.3	e2.4	e.00	e.00	e1.0	e11	e3.2	3.8	14	.49	e.40
6	e1.2	e2.4	e2.0	e.00	e.00	e1.2	e11	e2.9	15	13	.45	e.45
7	e1.2	e2.6	e1.5	e.00	e.00	e1.6	e12	e2.7	7.0	13	.34	e1.0
8	e1.2	e2.7	e1.0	e.00	e.00	e2.0	e13	e2.5	8.6	11	.37	e.80
9	e1.2	e2.9	e.70	e.00	e.00	e2.4	e14	e2.4	8.2	11	.33	e.60
10	e1.2	e3.0	e.40	e.00	e.00	e2.6	e15	e2.3	7.0	10	.28	e.45
11	e1.2	e3.0	e.15	e.00	e.00	e3.0	e16	e2.2	7.8	9.6	.21	e.35
12	e1.2	e3.1	e.00	e.00	e.00	e3.5	e17	e2.0	11	8.3	.12	e.30
13	e1.3	e3.2	e.00	e.00	e.00	e3.0	e18	e1.9	24	7.4	.05	e.30
14	e1.4	e3.2	e.00	e.00	e.00	e2.9	e19	e1.8	14	6.9	.00	e.25
15	e1.5	e3.3	e.00	e.00	e.00	e2.8	e20	e1.7	14	6.2	.00	e.24
16	e1.7	e3.2	e.00	e.00	e.00	e2.8	e19	e1.7	16	5.4	.00	e.23
17	e2.0	e3.1	e.00	e.00	e.00	e2.8	e18	e1.6	24	4.9	.00	e.22
18	e1.5	e3.0	e.00	e.00	e.00	e2.8	e17	e1.6	23	4.3	.00	e1.2
19	e1.6	e3.0	e.00	e.00	e.00	e3.8	e16	e1.5	23	3.1	.00	e.90
20	e1.4	e2.9	e.00	e.00	e.10	e4.5	e14	e1.5	19	2.9	.00	e.80
21	e1.2	e2.9	e.00	e.00	e.20	e3.5	e12	e1.4	16	3.1	.00	e.70
22	e1.2	e2.9	e.00	e.00	e.30	e3.0	e10	e1.4	14	3.1	.00	e.65
23	e1.4	e2.8	e.00	e.00	e.25	e3.0	e8.5	1.4	12	3.0	.00	e.60
24	e1.3	e2.9	e.00	e.00	e.20	e2.9	e7.5	1.1	10	2.8	.00	e.58
25	e1.1	e2.9	e.00	e.00	e.15	e2.9	e7.0	.81	9.9	2.4	e.20	e.56
26	e1.1	e2.9	e.00	e.00	e.15	e2.9	e6.2	.96	8.2	2.7	e.50	e.54
27	e1.1	e2.5	e.00	e.00	e.15	e3.4	e5.8	1.8	10	2.4	e.45	e.54
28	e1.1	e2.5	e.00	e.00	e.20	e4.0	e15	2.4	11	1.9	e.35	.29
29	e1.4	e2.5	e.00	e.00	---	e5.0	e7.0	1.8	12	1.6	e.30	.19
30	e1.1	e2.5	e.00	e.00	---	e6.0	e5.0	1.3	16	1.4	e.25	1.1
31	e1.0	---	e.00	e.00	---	e7.0	---	1.2	---	1.2	e.20	---
TOTAL	39.4	79.7	18.05	0.00	1.70	88.55	369.7	64.57	368.3	226.6	8.24	14.98
MEAN	1.27	2.66	.58	.000	.061	2.86	12.3	2.08	12.3	7.31	.27	.50
MAX	2.0	3.3	2.5	.00	.30	7.0	20	4.5	24	19	1.0	1.2
MIN	1.0	1.0	.00	.00	.00	.30	5.0	.81	1.0	1.2	.00	.17
AC-FT	78	158	36	.00	3.4	176	733	128	731	449	16	30

CAL YR 1989 TOTAL 2599.21 MEAN 7.12 MAX 236 MIN .00 AC-FT 5160
WTR YR 1990 TOTAL 1279.79 MEAN 3.51 MAX 24 MIN .00 AC-FT 2540

e Estimated

05057200 BALDHILL CREEK NEAR DAZEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
11...	1120	1.2	970	--	11.5	9.5	--	--	--	--	--	--
NOV												
21...	1140	2.9	800	--	-0.5	2.0	--	--	--	--	--	--
MAR												
07...	1120	1.6	1320	--	2.0	1.0	--	--	--	--	--	--
27...	1610	3.4	890	--	0.5	1.5	--	--	--	--	--	--
30...	1340	5.9	695	7.5	10.0	8.5	290	69	29	32	19	0.8
MAY												
03...	1200	3.6	465	--	17.0	10.5	--	--	--	--	--	--
22...	1335	1.4	925	--	24.0	18.0	--	--	--	--	--	--
JUN												
26...	1315	8.2	1140	--	30.5	29.0	--	--	--	--	--	--
AUG												
08...	1015	0.40	855	8.4	20.5	22.0	310	49	45	70	32	2
SEP												
27...	1220	0.54	830	--	13.0	15.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	8.6	280	0	230	130	13	0.10	17	443	438	0.60
AUG											
08...	9.5	370	0	306	130	18	0.20	13	556	519	0.76

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
30...	7.06	1	90	70	<1	35	80	0.1	1	1	390
AUG											
08...	0.60	3	210	40	<1	69	90	<1.0	<1	1	410

05057500 LAKE ASHTABULA AT BALDHILL DAM, ND

LOCATION.--Lat 47°02'00", long 98°05'00", in NW¼ sec.18, T.141 N., R.58 W., Barnes County, Hydrologic Unit 09020203 at Baldhill Dam on Sheyenne River, and 8 mi northwest of Valley City.

DRAINAGE AREA.--7,470 mi², approximately, of which about 5,560 mi² is probably noncontributing, including 3,800 mi² in closed basins.

MONTHEND-ELEVATION AND CONTENTS RECORDS

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

REVISED RECORDS.--WSP 1238: 1950(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth-filled 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-ft. 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 U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 91,400 acre-ft, May 14, 1950, elevation, 1,269.46 ft; minimum since reservoir first reached spillway level, 6,660 acre-ft, Aug. 11-14, 1950, elevation, 1,245.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 67,630 acre-ft, July 12, elevation, 1,265.47 ft; minimum, 55,300 acre-ft, Mar. 7, elevation, 1,263.16 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,264.56	62,580	--
Oct. 31	1,264.07	59,880	-2,700
Nov. 30	1,263.92	59,100	-780
Dec. 31	1,263.63	57,650	-1,450
CAL YR 1989	--	--	-1,250
Jan. 31	1,263.39	56,450	-1,200
Feb. 28	1,263.20	55,500	-950
Mar. 31	1,263.38	56,400	+900
Apr. 30	1,264.18	60,490	+4,090
May 31	1,264.22	60,710	+220
June 30	1,265.25	66,400	+5,690
July 31	1,265.32	66,790	+390
Aug. 31	1,264.77	63,740	-3,050
Sept. 30	1,263.99	59,450	-4,290
WTR YR 1990	--	--	-3,130

05058000 SHEYENNE RIVER BELOW BALDHILL DAM, ND

LOCATION.--Lat 47°01'50", long 98°05'50", in NW¼ sec.18, T.141 N., R.58 W., Barnes County, Hydrologic Unit 09020204, on right bank 600 ft downstream from Baldhill Dam, 8 mi northwest of Valley City, and at mile 270.5.

DRAINAGE AREA.--7,470 mi², approximately, of which about 5,560 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 17-27, Feb. 13-15, and Aug. 17-28. Records good except those for Aug. 17-28, which are fair. Flow completely regulated by Lake Ashtabula (station 05057500). Records 1955 to 1972 include releases at Baldhill Dam to the fish-rearing ponds of the Fish and Wildlife Service. Small diversions are still made but not published.

AVERAGE DISCHARGE (UNADJUSTED).--41 years, 124 ft³/s, 89,840 acre-ft/yr; median of yearly mean discharges, 88 ft³/s, 63,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,740 ft³/s, Apr. 24, 1979, gage height, 36.26 ft; no flow at times in 1950, 1952-53, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 123 ft³/s, Sept. 13, gage height, 26.75 ft; minimum daily discharge, 6.1 ft³/s, May 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	33	23	17	12	13	14	9.0	7.7	11	39	29
2	19	28	24	17	12	13	14	8.5	8.4	11	67	28
3	17	22	24	17	12	14	14	8.1	8.6	11	69	28
4	20	22	23	17	12	14	13	7.2	8.7	11	69	28
5	22	22	24	17	13	14	13	7.6	8.7	11	69	28
6	30	22	23	17	13	14	13	7.9	9.1	11	65	28
7	40	22	23	17	13	14	12	7.8	9.6	11	57	29
8	40	22	23	17	13	14	12	7.4	9.4	11	45	29
9	40	22	23	15	13	14	10	6.2	9.6	12	42	28
10	40	22	23	12	13	15	10	6.1	9.6	12	45	37
11	40	22	23	12	13	15	10	6.2	9.7	12	48	57
12	40	22	23	12	13	15	10	6.7	9.9	12	49	57
13	39	22	23	12	e13	15	10	6.9	9.9	12	49	87
14	40	22	24	12	e12	15	9.3	7.2	9.9	12	49	109
15	41	22	24	12	e11	15	7.8	7.1	9.8	12	49	110
16	37	22	24	12	11	15	7.2	7.1	9.8	12	45	109
17	33	21	e23	12	11	15	7.2	7.5	10	12	e44	108
18	33	21	e22	11	11	15	7.1	7.5	11	12	e43	109
19	34	20	e22	11	11	15	7.5	6.9	11	12	e42	97
20	34	21	e22	12	12	15	7.7	7.0	12	13	e41	98
21	34	24	e21	12	11	15	8.0	7.1	13	13	e39	102
22	34	24	e21	12	12	15	7.9	7.3	12	13	e38	84
23	33	24	e21	12	12	16	8.0	7.8	11	13	e37	82
24	33	24	e21	12	12	16	8.8	7.6	10	13	e35	68
25	33	24	e21	12	12	16	9.6	7.4	11	13	e34	57
26	33	24	e21	12	13	16	9.7	7.5	11	15	e33	37
27	33	24	e21	12	13	16	10	7.5	11	19	e32	21
28	33	24	21	12	13	16	11	7.2	11	20	e31	13
29	33	24	20	12	---	15	10	7.1	11	20	30	11
30	33	24	17	12	---	14	9.4	7.7	11	20	29	9.5
31	33	---	17	12	---	14	---	7.8	---	20	29	---
TOTAL	1023	692	685	413	342	458	301.2	227.9	304.4	412	1393	1717.5
MEAN	33.0	23.1	22.1	13.3	12.2	14.8	10.0	7.35	10.1	13.3	44.9	57.2
MAX	41	33	24	17	13	16	14	9.0	13	20	69	110
MIN	17	20	17	11	11	13	7.1	6.1	7.7	11	29	9.5
AC-FT	2030	1370	1360	819	678	908	597	452	604	817	2760	3410

CAL YR 1989 TOTAL 18092.5 MEAN 49.6 MAX 641 MIN 8.0 AC-FT 35890
WTR YR 1990 TOTAL 7969.0 MEAN 21.8 MAX 110 MIN 6.1 AC-FT 15810

e Estimated

05058000 SHEYENNE RIVER BELOW BALDHILL DAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
17...	1345	36	655	--	5.0	10.0	--	--	--	--	--	--
NOV												
28...	1315	23	695	--	-10.0	2.5	--	--	--	--	--	--
JAN												
16...	1220	12	760	--	-1.5	4.0	--	--	--	--	--	--
MAR												
06...	1250	15	930	--	0.5	1.0	--	--	--	--	--	--
28...	0840	15	1020	--	-2.0	1.0	--	--	--	--	--	--
APR												
03...	1120	13	960	8.0	2.5	4.5	320	63	39	80	34	2
MAY												
04...	1030	7.4	725	--	10.5	12.0	--	--	--	--	--	--
JUN												
04...	1035	8.4	865	--	8.5	16.5	--	--	--	--	--	--
JUL												
13...	0815	12	746	8.1	18.5	21.5	250	47	31	65	36	2
AUG												
29...	1355	30	760	--	21.0	22.5	--	--	--	--	--	--
SEP												
26...	1350	25	665	--	20.5	17.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
03...	12	360	0	290	180	19	0.20	19	625	589	0.85
JUL											
13...	8.7	290	0	235	140	18	0.20	8.8	485	460	0.66

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
03...	22.6	4	170	50	<1	65	1700	0.1	1	<1	410
JUL											
13...	15.2	4	130	40	<1	53	220	0.2	1	1	350

05058500 SHEYENNE RIVER AT VALLEY CITY, ND

LOCATION.--Lat 46°54'50", long 98°00'30", in SE¼NW¼ sec.28, T.140 N., R.58 W., Barnes County, Hydrologic Unit 09020204, on left bank 100 ft downstream from College Dam in Valley City, and at mile 253.0.

DRAINAGE AREA.--7,810 mi², approximately, of which about 5,700 mi² is probably noncontributing, includes 3,800 mi² in closed basins.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March to August 1919, March to June 1938, August 1938 to September 1975; October 1979 to current year (gage heights and annual maximum discharge since 1979). Records for July 1938, published in WSP 855, have been found to be unreliable and should not be used.

REVISED RECORDS.---WSP 1388: 1939 (M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,199.27 ft above National Geodetic Vertical Datum of 1929. March to August 1919, nonrecording gage at site 0.5 mi upstream at different datum. March to Oct. 13, 1938, nonrecording gage at present site and datum.

REMARKS.--Flow regulated by Lake Ashtabula 13 mi upstream (see station 05057500). Small diversions above station for municipal supply.

AVERAGE DISCHARGE (UNADJUSTED).--37 years (1938-75), 124 ft³/s, 89,840 acre-ft/yr; median of yearly mean discharges, 97 ft³/s, 70,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,580 ft³/s, 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 278 ft³/s, July 11, gage height, 4.59 ft, minimum not determined.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	3.05	2.96	2.92	2.86	2.90	2.90	2.78	2.80	2.84	2.77	2.93
2	---	3.05	2.95	2.92	2.86	2.90	2.86	2.78	3.32	2.84	2.84	2.91
3	---	3.03	2.95	2.92	2.86	2.88	2.86	2.77	3.16	2.83	3.01	2.91
4	---	3.01	2.96	2.93	2.87	2.88	2.86	2.77	2.93	2.80	3.04	2.91
5	---	2.99	2.96	2.92	2.87	2.87	2.85	2.75	2.88	2.78	3.03	2.96
6	---	2.95	2.96	2.92	2.88	2.87	2.83	2.74	2.82	2.77	3.04	2.96
7	---	2.95	2.95	2.92	2.87	2.87	2.83	2.77	2.84	2.79	3.03	3.04
8	---	2.97	2.94	2.94	2.87	2.85	2.83	2.75	2.87	2.83	3.01	2.95
9	---	2.95	2.96	2.94	2.89	2.84	2.83	2.74	2.82	2.92	2.97	2.95
10	---	2.94	2.95	2.92	2.88	2.85	2.81	2.71	2.82	3.48	2.95	2.94
11	---	2.95	2.95	2.89	2.88	2.89	2.80	2.68	2.84	4.06	2.92	3.00
12	---	2.93	2.95	2.83	2.88	2.94	2.78	2.68	2.92	3.51	2.93	3.11
13	---	2.95	2.95	2.87	2.87	2.88	2.76	2.69	3.10	3.32	2.94	3.17
14	---	3.00	2.94	2.87	2.88	2.87	2.75	2.75	3.39	3.28	2.95	3.52
15	---	2.84	2.94	2.87	2.88	2.85	2.73	2.76	3.24	3.36	2.93	3.73
16	---	2.87	2.95	2.88	2.87	2.85	2.75	2.81	3.02	3.35	2.93	3.73
17	---	2.91	2.95	2.88	2.85	2.84	2.72	2.79	3.01	2.82	2.94	3.78
18	3.04	2.91	2.96	2.87	2.85	2.83	2.68	2.73	3.07	2.80	3.04	4.05
19	3.05	2.91	2.95	2.87	2.86	2.83	2.70	2.75	3.50	2.80	2.95	3.79
20	3.11	2.91	2.94	2.87	2.85	2.84	2.70	2.77	3.29	2.79	2.93	3.62
21	3.10	2.91	2.94	2.86	2.87	2.85	2.69	2.77	3.08	2.80	2.93	3.59
22	3.10	2.93	2.93	2.87	2.88	2.85	2.71	2.80	2.89	2.79	2.93	3.49
23	3.10	2.93	2.92	2.87	2.88	2.83	2.74	2.80	2.86	2.78	2.93	3.31
24	3.10	2.93	2.93	2.88	2.88	2.84	2.72	2.78	2.84	2.77	2.94	3.28
25	3.10	2.94	2.95	2.88	2.87	2.84	2.73	2.74	2.89	2.79	2.99	3.21
26	3.10	2.94	2.95	2.87	2.87	2.84	2.80	2.84	2.88	2.80	3.01	3.19
27	3.09	2.95	2.95	2.88	2.87	2.85	2.81	2.81	2.98	2.80	2.95	3.15
28	3.08	2.94	2.96	2.87	2.88	2.87	2.86	2.78	2.92	2.82	2.94	3.12
29	3.10	2.96	2.94	2.88	---	2.89	2.82	2.76	2.89	2.83	2.93	3.06
30	3.08	2.96	2.93	2.86	---	2.90	2.80	2.71	2.86	2.82	2.93	2.51
31	3.08	---	2.92	2.87	---	2.89	---	2.67	---	2.80	2.94	---
MEAN	---	2.95	2.95	2.89	2.87	2.86	2.78	2.76	2.99	2.96	2.95	3.23
MAX	---	3.05	2.96	2.94	2.89	2.94	2.90	2.84	3.50	4.06	3.04	4.05
MIN	---	2.84	2.92	2.83	2.85	2.83	2.68	2.67	2.80	2.77	2.77	2.51

05058500 SHEYENNE RIVER AT VALLEY CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
APR 03...	0930	15	850	8.4	2.0	5.0	280	57	34	66	33	2

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 03...	11	290	0	240	160	20	0.10	13	529	506	0.72

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 03...	21.9	3	170	10	1	55	660	0.1	2	<1	360

05058700 SHEYENNE RIVER AT LISBON, ND

LOCATION.--Lat 46°26'49", long 97°40'44", on line between secs.1 and 2, T.134 N., R.56 W., Ransom County, Hydrologic Unit 09020204, on left bank 150 ft downstream from dam at State Fish Hatchery at north edge of city of Lisbon, 3 mi upstream from Timber Coulee, and at mile 162.1.

DRAINAGE AREA.--8,190 mi^2, approximately, of which about 5,700 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,066.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow regulated by Lake Ashtabula (station 05057500) 108.5 mi upstream.

AVERAGE DISCHARGE.--34 years, 155 ft^3/s, 112,300 acre-ft/yr; median of yearly mean discharges, 138 ft^3/s, 100,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,270 ft^3/s, July 1, 1975, gage height, 19.04 ft; no flow Sept. 19-21, Oct. 23, 24, 1956, Aug. 16, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 311 ft^3/s, June 4, gage height, 3.74 ft; minimum daily, 1.7 ft^3/s, Oct. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	35	23	21	17	21	52	26	19	41	10	35
2	19	33	24	21	16	21	53	28	29	43	13	32
3	20	33	23	22	15	21	58	29	111	44	9.8	26
4	21	33	23	23	14	22	61	26	289	35	9.5	22
5	23	34	24	23	14	22	43	24	214	28	9.9	23
6	20	35	25	24	15	23	42	22	119	24	10	23
7	22	35	24	23	15	23	38	21	84	23	9.7	27
8	22	34	23	23	15	23	36	18	67	22	9.6	25
9	23	31	23	23	17	24	34	17	62	20	9.5	26
10	21	28	22	23	17	25	29	16	50	19	24	25
11	23	27	20	23	17	29	26	15	4.1	21	34	26
12	28	26	18	23	17	44	23	15	30	19	36	32
13	40	27	17	24	18	46	21	15	70	21	35	34
14	42	27	16	24	18	47	21	16	89	23	33	29
15	43	26	15	25	18	42	21	16	48	21	29	25
16	41	20	14	25	17	43	22	20	34	17	26	22
17	42	24	13	23	17	41	21	18	33	19	24	30
18	42	22	13	22	16	40	19	17	31	18	23	79
19	42	27	13	21	16	36	19	18	30	17	23	103
20	44	25	13	21	15	34	18	17	29	16	24	109
21	43	25	13	20	19	30	18	16	36	14	51	117
22	39	25	13	19	19	29	18	18	38	13	14	125
23	36	26	12	19	18	27	18	18	35	13	22	119
24	36	24	11	19	18	27	16	17	39	13	34	104
25	59	23	13	19	18	26	17	16	38	21	32	93
26	79	23	13	18	18	26	19	16	34	16	36	84
27	44	25	13	19	18	28	20	15	36	15	31	76
28	1.7	23	15	19	18	30	24	15	38	14	30	71
29	9.3	23	15	19	---	31	26	17	36	13	28	69
30	31	23	17	19	---	35	27	17	38	12	27	63
31	34	---	20	18	---	42	---	17	---	11	34	---
TOTAL	1008.0	822	541	665	470	958	860	576	1810.1	646	741.0	1674
MEAN	32.5	27.4	17.5	21.5	16.8	30.9	28.7	18.6	60.3	20.8	23.9	55.8
MAX	79	35	25	25	19	47	61	29	289	44	51	125
MIN	1.7	20	11	18	14	21	16	15	4.1	11	9.5	22
AC-FT	2000	1630	1070	1320	932	1900	1710	1140	3590	1280	1470	3320

CAL YR 1989 TOTAL 27261.8 MEAN 74.7 MAX 968 MIN 1.7 AC-FT 54070
WTR YR 1990 TOTAL 10771.1 MEAN 29.5 MAX 289 MIN 1.7 AC-FT 21360

05058700 SHEYENNE RIVER AT LISBON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
13...	1115	40	930	--	17.0	10.0	--	--	--	--	--	--
NOV												
29...	1035	23	940	--	3.0	1.5	--	--	--	--	--	--
JAN												
18...	1340	21	1330	--	-2.0	0.0	--	--	--	--	--	--
MAR												
06...	1805	23	1090	--	-0.5	0.5	--	--	--	--	--	--
APR												
02...	1530	55	1020	8.2	5.0	4.0	210	47	22	53	35	2
26...	1310	21	790	--	8.0	17.0	--	--	--	--	--	--
JUN												
04...	1700	306	1000	--	9.5	16.5	--	--	--	--	--	--
JUL												
12...	1140	18	1010	8.1	22.5	21.5	320	73	33	92	38	2
AUG												
30...	0900	27	968	--	22.0	24.0	--	--	--	--	--	--
SEP												
25...	1120	100	805	--	26.0	18.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	7.8	200	0	170	140	28	0.20	4.0	402	403	0.55
JUL											
12...	12	290	0	235	220	53	0.30	20	677	646	0.92

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	59.9	1	140	30	1	42	70	0.2	1	<1	340
JUL											
12...	33.8	7	220	50	<1	67	400	0.1	2	1	520

05059000 SHEYENNE RIVER NEAR KINDRED, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°37'35", long 97°00'05", in $NE^{1}/_{4}NW^{1}/_{4}$ sec.5, T.136 N., R.50 W., Richland County, Hydrologic Unit 09020204, on right bank 25 ft downstream from Burlington Northern Railway bridge, 1.5 mi southeast of Kindred, and at mile 68.1.

DRAINAGE AREA.--8,800 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

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

REMARKS.--Estimated daily discharges: Nov. 23 to Feb. 6 and Feb. 14-28. Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 202 mi upstream and several small reservoirs.

AVERAGE DISCHARGE.--41 years, 197 ft^3/s, 142,700 acre-ft/yr; median of yearly mean discharges, 154 ft^3/s, 112,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,690 ft^3/s, Apr. 15, 1969, gage height, 21.03 ft; maximum gage height, 21.66 ft, July 6, 1975; minimum daily discharge, 13 ft^3/s, Nov. 13, 1955, Aug. 22-24, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Spring flood in 1947 or 1948 reached a stage of 22.1 ft from floodmarks, discharge about 3,600 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 286 ft^3/s, June 7, gage height, 3.42 ft; minimum daily discharge, 9.2 ft^3/s, Aug. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	68	e52	e18	e23	43	135	81	35	78	25	49
2	45	49	e52	e19	e25	43	148	78	38	71	23	46
3	44	29	e50	e19	e28	44	135	74	51	72	21	44
4	45	49	e50	e20	e32	45	149	72	68	63	20	42
5	44	65	e48	e20	e38	45	195	69	68	60	20	47
6	45	70	e46	e21	e42	48	171	69	71	61	20	50
7	44	67	e46	e22	46	50	144	71	238	62	17	52
8	44	67	e44	e23	44	52	167	75	265	61	20	51
9	45	66	e42	e24	40	54	170	69	201	55	19	50
10	46	66	e40	e24	30	53	178	65	155	52	16	49
11	47	67	e38	e25	39	59	154	62	124	50	14	48
12	47	67	e36	e25	41	77	117	59	109	42	14	49
13	47	66	e34	e26	32	104	96	55	98	37	14	47
14	47	63	e33	e27	e30	103	90	51	83	38	13	44
15	46	58	e32	e27	e29	134	85	46	59	40	11	42
16	46	27	e31	e28	e28	164	81	49	49	37	9.2	40
17	47	40	e30	e28	e28	129	76	45	98	35	17	43
18	52	43	e29	e28	e30	129	74	41	120	33	29	49
19	53	44	e29	e28	e34	172	71	40	98	29	28	50
20	55	51	e28	e28	e36	144	70	39	78	29	23	49
21	55	53	e27	e28	e34	122	70	43	71	24	28	47
22	57	54	e26	e28	e32	115	70	44	69	23	30	54
23	57	e54	e25	e28	e30	113	71	41	67	26	28	74
24	57	e54	e24	e28	e28	108	70	42	60	25	25	77
25	63	e54	e23	e28	e26	107	68	42	70	24	25	79
26	67	e54	e22	e27	e24	97	67	40	72	25	61	83
27	65	e54	e21	e26	e30	90	61	41	70	23	62	81
28	63	e54	e20	e26	e38	90	71	41	87	20	41	78
29	72	e54	e19	e25	---	94	74	42	103	20	48	76
30	99	e52	e18	e25	---	102	81	40	84	19	52	75
31	93	---	e18	e24	---	115	---	36	---	25	52	---
TOTAL	1680	1659	1033	773	917	2845	3209	1662	2859	1259	825.2	1665
MEAN	54.2	55.3	33.3	24.9	32.7	91.8	107	53.6	95.3	40.6	26.6	55.5
MAX	99	70	52	28	46	172	195	81	265	78	62	83
MIN	43	27	18	18	23	43	61	36	35	19	9.2	40
AC-FT	3330	3290	2050	1530	1820	5640	6370	3300	5670	2500	1640	3300

CAL YR 1989 TOTAL 42308 MEAN 116 MAX 1400 MIN 15 AC-FT 83920
WTR YR 1990 TOTAL 20386.2 MEAN 55.9 MAX 265 MIN 9.2 AC-FT 40440

e Estimated

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED
(National stream quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
19...	1335	53	940	8.4	5.0	4.0	1.6	12.0	92	K20	92
DEC											
13...	1255	34	1110	7.9	-22.0	0.0	3.3	11.8	81	--	--
JAN											
18...	1005	28	1100	--	-3.5	1.0	--	--	--	--	--
APR											
09...	1405	162	650	8.4	6.5	0.5	10	11.0	77	K43	K26
19...	1255	69	795	--	17.5	10.0	--	--	--	--	--
MAY											
30...	1130	41	902	8.2	24.0	19.5	6.0	7.2	79	K34	160
JUL											
17...	1255	35	880	8.0	24.5	26.0	14	6.2	78	110	190
AUG											
17...	1250	19	825	--	30.0	27.5	--	--	--	--	--
SEP											
27...	0955	82	835	--	15.0	13.5	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT										
19...	310	75	30	69	32	2	9.4	271	270	319
DEC										
13...	420	100	42	94	32	2	9.8	355	358	436
APR										
09...	220	54	21	49	32	1	6.4	179	178	210
MAY										
30...	320	81	29	64	30	2	7.7	280	282	344
JUL										
17...	300	76	27	63	30	2	9.5	259	251	306

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
OCT										
19...	5	180	35	0.30	14	579	575	0.79	82.4	<0.010
DEC										
13...	0	240	42	0.30	15	777	758	1.06	71.5	<0.010
APR										
09...	3	120	23	0.30	7.3	409	388	0.56	179	<0.010
MAY										
30...	0	160	34	0.20	15	568	560	0.77	62.6	--
JUL										
17...	0	160	35	0.30	23	547	546	0.74	51.5	<0.010

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED
(National stream quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
OCT 19...	<0.100	0.040	<0.010	0.60	0.090	0.070	0.050	<10	4	94
DEC 13...	<0.100	0.030	0.050	0.70	0.050	0.030	0.020	--	--	--
APR 09...	<0.100	0.020	<0.010	1.3	0.130	0.020	<0.010	20	2	69
JUL 17...	0.100	0.010	0.030	1.0	0.210	0.080	0.080	10	11	110

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT 19...	<0.5	<1.0	1	<3	1	10	<1	56	27	<0.1
APR 09...	<0.5	<1.0	<1	<3	2	92	<1	38	200	<0.1
JUL 17...	<0.5	2.0	<1	<3	2	9	<1	51	9	<0.1

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 19...	10	4	<1	<1.0	360	<6	6	18	2.6	55
DEC 13...	--	--	--	--	--	--	--	12	1.1	81
APR 09...	<10	4	<1	<1.0	260	<6	8	34	15	90
MAY 30...	--	--	--	--	--	--	--	30	3.3	56
JUL 17...	<10	5	<1	<1.0	370	<6	4	50	4.7	98

05059400 SHEYENNE RIVER NEAR HORACE, ND

LOCATION.--Lat 46°48'13", long 96°54'13", in $NW^1/_4NW^1/_4$ sec.5, T.138 N., R.49 W., Cass County, Hydrologic Unit 09020204, at bridge on county road 3 mi north and 0.1 mi east of Horace.

DRAINAGE AREA.--8,850 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1979 to current year (gage heights and annual maximum discharge).

GAGE.--Water-stage recorder. Datum of gage is 888.94 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Flow regulated to a large degree by Lake Ashtabula (station 05057500) 241 mi upstream. Above 3,000 ft^3/s overflow occurs upstream between Kindred and Horace. This overflow bypasses the station by flowing into the Maple River to the west and into the Wild Rice River to the east.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,960 ft^3/s, Mar. 28, 1987, determined from a hydrographic comparison with stations 05059000, Sheyenne River near Kindred, ND and 05059500, Sheyenne River at West Fargo, ND; maximum recorded gage height, 22.06 ft, Mar. 28, 1987, ice jam; minimum not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 150 ft^3/s, June 9, gage height, 7.11 ft; maximum gage height, 8.10 ft, Mar. 28, ice jam; minimum not determined.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.70	5.46	4.94	---	5.72	6.07	6.64	---	4.61	5.34	---	4.65
2	4.70	5.29	4.99	---	5.68	5.91	6.79	---	5.11	5.20	---	4.64
3	4.70	4.86	5.01	---	5.81	5.85	6.82	5.12	4.97	5.18	4.15	4.60
4	4.69	4.73	5.05	---	6.03	5.75	6.78	5.08	4.99	5.07	4.12	4.58
5	4.68	4.62	5.06	---	5.91	5.76	7.01	5.04	5.18	4.99	4.07	4.55
6	4.67	4.83	5.08	---	5.81	5.80	7.02	5.00	5.27	4.89	4.06	4.54
7	4.66	5.01	5.09	---	5.79	5.80	6.89	4.96	5.23	4.87	4.06	4.65
8	4.65	5.05	5.06	---	5.80	5.86	6.75	4.94	6.13	4.90	4.03	4.68
9	4.64	5.00	5.13	---	5.80	5.86	6.50	4.92	7.04	4.89	4.00	4.69
10	4.64	5.00	5.13	---	5.74	---	6.73	4.90	6.72	4.83	4.04	4.65
11	4.54	4.99	5.19	---	5.69	---	6.73	4.85	6.26	4.80	4.03	4.59
12	4.05	4.98	4.97	---	5.76	---	6.64	4.80	5.97	4.75	3.96	4.57
13	4.38	4.97	4.74	---	5.74	---	5.99	4.77	5.73	4.62	3.95	4.55
14	4.24	4.98	4.96	---	5.66	---	5.62	4.79	5.60	4.50	3.93	4.55
15	4.24	4.91	5.02	---	5.73	---	---	4.72	5.48	4.40	3.93	4.51
16	4.28	4.74	4.82	---	5.74	---	---	4.72	5.26	4.43	3.93	4.47
17	4.32	4.76	4.80	---	5.88	---	---	4.78	4.95	---	3.92	4.46
18	4.27	4.74	5.26	---	5.71	---	---	4.80	5.01	---	3.94	4.49
19	4.34	4.71	5.26	5.79	5.83	---	---	4.76	5.72	---	4.10	4.57
20	4.58	4.70	5.22	5.84	5.83	---	---	4.74	5.65	---	4.30	4.67
21	4.68	4.73	5.12	5.84	6.01	---	---	4.71	5.38	---	4.26	4.68
22	4.72	4.92	5.09	5.91	5.98	---	---	4.72	5.20	---	4.19	4.64
23	4.74	4.87	4.99	5.91	5.92	---	---	4.77	5.14	---	4.28	4.62
24	4.85	4.83	5.12	5.91	5.86	---	---	4.74	5.07	---	4.31	5.05
25	5.01	4.89	5.25	5.89	5.60	---	---	4.71	5.01	---	4.27	5.48
26	5.02	4.87	5.20	5.91	5.70	---	---	4.73	4.98	---	4.31	5.61
27	5.02	4.94	---	5.88	5.88	---	---	4.73	5.11	---	4.38	5.71
28	4.99	4.94	---	5.91	5.92	6.86	---	4.71	5.10	---	4.87	5.77
29	4.96	4.94	---	5.84	---	6.86	---	4.69	5.14	---	4.73	5.73
30	4.92	4.92	---	5.78	---	6.70	---	4.67	5.40	---	4.50	5.66
31	5.21	---	---	5.83	---	6.66	---	4.64	---	---	4.61	---
MEAN	4.65	4.91	---	---	5.80	---	---	---	5.41	---	---	4.82
MAX	5.21	5.46	---	---	6.03	---	---	---	7.04	---	---	5.77
MIN	4.05	4.62	---	---	5.60	---	---	---	4.61	---	---	4.46

05059400 SHEYENNE RIVER NEAR HORACE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
APR 12...	0915	88	655	8.5	3.0	8.5	230	55	22	49	31	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 12...	6.8	220	0	180	130	26	0.20	8.6	408	408	0.55

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 12...	97.1	1	140	10	<1	37	170	0.2	1	1	320

05059500 SHEYENNE RIVER AT WEST FARGO, ND

LOCATION.--Lat 46°53'28", long 96°54'24", in $SE^1/_4SE^1/_4$ sec.31, T.140 N., R.49 W., Cass County, Hydrologic Unit 09020204, on right bank at downstream side of county highway bridge, 1 mi north of West Fargo, 3 mi upstream from Maple River, and at mile 24.5.

DRAINAGE AREA.--8,870 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--WSP 1388: 1904(M). WSP 1728: Drainage area. See also "PERIOD OF RECORD."

GAGE.--Water-stage recorder. Datum of gage is 877.19 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Oct. 12, 13, Nov. 25 to Apr. 13, Aug. 15-17, and Aug. 19. Records good except those for period Nov. 25 to Apr. 13, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 246 mi upstream. Above 3,000 ft^3/s overflow that occurs upstream from the gaging station Sheyenne River near Horace (station 05059400) bypasses this station by flowing into the Maple River drainage to the west or into the Wild Rice River drainage to the east. This overflow is not included in the flow for this station. During some years, flow is diverted from just above the station into the Red River of the North in order to maintain adequate supply for municipal uses. Figures of daily discharge do not include this diversion.

AVERAGE DISCHARGE (ADJUSTED).--63 years (water years 1904-5, 1930-90), 178 ft^3/s, 129,000 acre-ft/yr; median of yearly mean discharges, 146 ft^3/s, 106,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,480 ft^3/s, Apr. 21, 1979, gage height, 22.12 ft, backwater from Red and/or Maple Rivers; maximum gage height, 22.25 ft, July 5, 1975, backwater from Red and/or Maple Rivers; minimum daily, 1.0 ft^3/s, Sept. 23, 1976, caused by diversion to Red River of the North.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 155 ft^3/s, June 9, gage height, 6.16 ft; minimum daily discharge, 11 ft^3/s, Aug. 13-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	104	e54	e19	e22	e33	e104	68	42	76	16	44
2	57	107	e52	e19	e21	e34	e108	69	88	70	19	45
3	56	102	e50	e19	e20	e34	e110	69	74	66	21	44
4	58	73	e50	e19	e20	e35	e125	68	63	64	20	42
5	57	64	e50	e20	e22	e36	e130	65	65	63	18	41
6	56	64	e47	e20	e23	e40	e132	63	71	60	16	40
7	55	77	e44	e20	e24	e42	e135	61	71	58	15	47
8	54	84	e41	e20	e25	e46	e132	59	88	58	15	46
9	55	83	e40	e21	e26	e50	e130	58	150	58	16	46
10	55	80	e38	e22	e27	e56	e120	58	143	58	13	45
11	55	80	e36	e22	e27	e58	e110	55	124	56	15	42
12	e31	79	e34	e22	e27	e62	e104	53	109	52	13	40
13	e24	78	e33	e22	e27	e64	e100	52	96	49	11	40
14	39	79	e32	e22	e27	e73	93	54	87	44	11	39
15	31	79	e32	e22	e25	e78	80	50	84	38	e11	38
16	36	81	e30	e22	e24	e82	75	48	75	38	e12	36
17	43	66	e28	e23	e24	e74	72	49	63	40	e13	35
18	40	62	e26	e24	e24	e75	71	53	56	39	13	41
19	36	59	e23	e24	e24	e77	69	51	92	37	e18	38
20	49	61	e22	e24	e24	e79	69	50	104	35	23	43
21	66	62	e21	e24	e25	e81	68	48	84	32	28	46
22	68	67	e20	e24	e26	e82	68	49	71	30	24	45
23	70	70	e19	e24	e31	e82	67	51	67	27	24	43
24	69	66	e18	e24	e32	e85	65	50	64	25	29	49
25	85	e62	e17	e24	e32	e88	65	48	62	25	28	74
26	86	e60	e17	e24	e32	e89	64	50	59	25	36	83
27	87	e58	e17	e24	e32	e92	63	50	68	25	29	89
28	85	e56	e18	e24	e32	e96	70	47	66	24	44	95
29	84	e54	e18	e24	---	e100	68	46	64	23	55	95
30	79	e54	e18	e24	---	e106	69	44	70	20	42	92
31	82	---	e18	e24	---	e110	---	43	---	17	36	---
TOTAL	1801	2171	963	690	725	2139	2736	1679	2420	1332	684	1543
MEAN	58.1	72.4	31.1	22.3	25.9	69.0	91.2	54.2	80.7	43.0	22.1	51.4
MAX	87	107	54	24	32	110	135	69	150	76	55	95
MIN	24	54	17	19	20	33	63	43	42	17	11	35
AC-FT	3570	4310	1910	1370	1440	4240	5430	3330	4800	2640	1360	3060

CAL YR 1989 TOTAL 43165 MEAN 118 MAX 1400 MIN 17 AC-FT 85620
WTR YR 1990 TOTAL 18883 MEAN 51.7 MAX 150 MIN 11 AC-FT 37450

e Estimated

05059500 SHEYENNE RIVER AT WEST FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
12...	1725	15	905	--	21.0	11.0	--	--	--	--	--	--
DEC												
12...	1225	34	1000	--	-15.0	0.0	--	--	--	--	--	--
JAN												
18...	1630	24	1340	--	-2.5	0.5	--	--	--	--	--	--
APR												
12...	1300	105	725	8.5	5.0	8.0	220	53	21	46	31	1
25...	0920	67	742	--	18.5	17.0	--	--	--	--	--	--
JUN												
07...	1120	71	792	--	22.0	16.0	--	--	--	--	--	--
JUL												
11...	0940	56	855	--	20.5	21.5	--	--	--	--	--	--
AUG												
23...	1220	25	795	8.3	29.0	24.0	320	77	30	56	27	1
SEP												
26...	1645	83	920	--	25.0	21.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
12...	6.6	210	0	170	120	25	0.20	8.1	389	383	0.53
AUG											
23...	7.3	330	0	270	120	33	0.30	23	506	509	0.69

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
12...	110	2	120	30	<1	34	150	0.2	1	<1	340
AUG											
23...	33.5	7	180	20	<1	45	30	<1.0	2	<1	440

05059600 MAPLE RIVER NEAR HOPE, ND

LOCATION.--Lat 47°19'30", long 97°47'25", in $NW^{1}/_{4}NW^{1}/_{4}$ sec.4, T.144 N., R.56 W., Steele County, Hydrologic Unit 09020205, 100 ft downstream from box culvert on State Highway 38, 500 ft east of the intersection of State Highway 32 and 38, and 3 mi west of Hope.

DRAINAGE AREA.--20.2 mi^2, of which about 2.8 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Datum of gage is 1,296.62 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 12-29, Apr. 9-29, and June 13 to July 12. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--18 years (water years 1965-82), 2.82 ft^3/s, 2,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft^3/s, Apr. 18, 1979, gage height, 5.86 ft, backwater from ice; maximum gage height, 6.49 ft, Mar. 21, 1987; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.1 ft^3/s, June 13, gage height, 3.08 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.22	.00	.00	e.50	.00	.00
2	---	---	---	---	---	.00	.21	.00	.08	e.20	.00	.00
3	---	---	---	---	---	.00	.15	.00	.20	e.10	.00	.00
4	---	---	---	---	---	.00	.08	.00	.20	e.07	.00	.00
5	---	---	---	---	---	.00	.01	.00	.18	e.05	.00	.00
6	---	---	---	---	---	.00	.01	.00	.14	e.03	.00	.00
7	---	---	---	---	---	.00	.00	.00	.12	e.02	.00	.00
8	---	---	---	---	---	.00	.00	.00	.11	e.10	.00	.00
9	---	---	---	---	---	.00	e.01	.00	.07	e.02	.00	.00
10	---	---	---	---	---	.00	e.00	.00	.06	e.01	.00	.00
11	---	---	---	---	---	.00	e.00	.00	.04	e.00	.00	.00
12	---	---	---	---	---	e.05	e.00	.00	1.2	e.00	.00	.00
13	---	---	---	---	---	e.01	e.00	.00	e3.2	.00	.00	.00
14	---	---	---	---	---	e.01	e.00	.00	e1.8	.00	.00	.00
15	---	---	---	---	---	e.01	e.00	.00	e2.2	.00	.00	.00
16	---	---	---	---	---	e.01	e.00	.00	e1.8	.00	.00	.00
17	---	---	---	---	---	e.01	e.00	.00	e1.6	.00	.00	.00
18	---	---	---	---	---	e.01	e.00	.00	e1.4	.00	.01	.00
19	---	---	---	---	---	e.01	e.00	.00	e1.6	.00	.00	.00
20	---	---	---	---	---	e.05	e.00	.00	e2.0	.00	.00	.00
21	---	---	---	---	---	e.10	e.00	.00	e2.5	.00	.00	.00
22	---	---	---	---	---	e.05	e.00	.00	e2.0	.00	.00	.00
23	---	---	---	---	---	e.01	e.00	.00	e1.8	.00	.00	.00
24	---	---	---	---	---	e.01	e.00	.00	e1.6	.00	.00	.00
25	---	---	---	---	---	e.01	e.00	.00	e1.4	.00	.00	.00
26	---	---	---	---	---	e.01	e.00	.00	e1.3	.00	.00	.00
27	---	---	---	---	---	e.01	e.00	.00	e2.0	.00	.00	.00
28	---	---	---	---	---	e.01	e.00	.00	e3.0	.00	.00	.00
29	---	---	---	---	---	e.01	e.00	.00	e2.0	.00	.00	.00
30	---	---	---	---	---	.03	.00	.00	e1.0	.00	.00	.00
31	---	---	---	---	---	.26	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.68	0.69	0.00	36.60	1.10	0.01	0.00
MEAN	---	---	---	---	---	.022	.023	.000	1.22	.035	.000	.000
MAX	---	---	---	---	---	.26	.22	.00	3.2	.50	.01	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	1.3	1.4	.00	73	2.2	.02	.00

e Estimated

05059600 MAPLE RIVER NEAR HOPE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)
MAR												
27...	1315	0.01	1260	--	-0.5	1.0	--	--	--	--	--	--
30...	1435	0.12	462	8.1	15.0	2.0	170	38	18	19	18	0.6
APR												
03...	1325	0.17	420	--	4.0	3.5	--	--	--	--	--	--
09...	1020	0.01	610	--	0.5	1.5	--	--	--	--	--	--
JUN												
13...	1030	4.1	852	7.6	19.0	18.5	310	71	33	45	23	1
27...	1240	1.2	1520	--	20.0	23.0	--	--	--	--	--	--

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE, FET-LAB (MG/L AS HCO3) (95440)	CARBONATE, FET-LAB (MG/L AS CO3) (95445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
MAR											
30...	11	130	0	170	87	24	0.10	16	287	276	0.39
JUN											
13...	8.2	220	0	181	210	14	0.20	28	553	519	0.75

DATE	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
MAR											
30...	0.09	2	30	60	<1	22	290	0.1	2	1	240
JUN											
13...	6.12	4	90	90	<1	35	80	<0.1	<1	<1	320

05059700 MAPLE RIVER NEAR ENDERLIN, ND

LOCATION.--Lat 46°37'18", long 97°34'25", on west line sec.2, T.136 N., R.55 W., Ransom County, Hydrologic Unit 09020205, on left bank 25 ft downstream from county highway bridge, 1 mi downstream from South Branch, and 1.2 mi east of Enderlin.

DRAINAGE AREA.--843 mi^2, of which about 47 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,056.72 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Dec. 1 to Jan. 7, Jan. 11, 12, Jan. 29 to Feb. 10, Feb. 23, 24, and Mar. 1-6.

AVERAGE DISCHARGE.--34 years, 39.6 ft^3/s, 28,690 acre-ft/yr; median of yearly mean discharges, 26 ft^3/s, 18,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,610 ft^3/s, June 30, 1975, gage height, 15.41 ft; minimum daily, 0.1 ft^3/s, Dec. 7-9, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 2	0145	*15	*3.37				

Minimum daily discharge, 0.82 ft^3/s, July 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	4.1	e2.0	e1.5	e1.8	e1.4	1.4	2.2	4.1	1.5	1.4	2.0
2	1.5	2.3	e2.0	e1.5	e1.8	e1.5	1.6	2.1	6.6	1.1	2.0	1.7
3	1.6	2.3	e2.0	e1.5	e1.8	e1.6	3.4	2.0	4.6	1.1	1.9	1.5
4	1.7	2.4	e2.0	e1.5	e1.8	e1.7	4.0	1.8	4.9	.82	1.9	1.7
5	1.5	2.2	e2.0	e1.5	e1.7	e1.7	3.4	1.8	4.3	1.2	1.7	1.8
6	1.6	2.2	e1.9	e1.6	e1.6	e1.7	3.4	1.9	4.1	1.4	1.7	2.2
7	1.6	2.3	e1.8	e1.6	e1.5	1.7	2.9	2.2	4.2	1.1	1.9	6.8
8	1.7	2.1	e1.7	1.7	e1.4	1.8	2.9	2.5	2.9	1.6	2.1	2.6
9	1.8	2.3	e1.7	1.7	e1.3	2.1	3.2	2.6	2.2	1.3	1.6	2.4
10	2.2	2.4	e1.7	1.7	e1.2	2.2	2.9	2.6	1.8	1.9	1.7	2.5
11	2.2	2.3	e1.7	e1.8	1.1	2.4	2.9	2.6	1.8	2.4	1.6	2.6
12	1.9	2.4	e1.6	e1.9	1.1	3.5	3.0	2.6	2.2	1.8	1.7	2.5
13	2.0	2.4	e1.5	1.7	1.2	2.8	2.9	2.7	2.0	1.9	1.6	2.5
14	2.0	2.5	e1.5	1.7	1.3	3.3	2.9	3.1	2.4	1.9	1.6	2.3
15	2.0	2.4	e1.4	1.7	1.4	3.1	2.8	3.0	3.4	2.2	1.5	2.1
16	2.2	2.5	e1.4	1.7	1.4	2.9	2.9	2.8	2.3	1.8	1.7	2.2
17	2.3	2.4	e1.3	1.8	1.3	2.9	2.9	2.8	1.7	2.3	1.9	2.0
18	2.3	2.3	e1.3	1.7	1.3	3.1	2.6	3.2	1.5	1.7	2.4	3.2
19	2.3	2.5	e1.2	1.7	1.3	3.2	2.4	2.3	2.6	1.5	1.7	2.6
20	2.3	2.4	e1.2	1.7	1.4	3.7	3.1	2.0	2.0	1.7	1.7	2.6
21	2.2	2.5	e1.0	1.7	1.5	3.9	2.4	1.9	2.0	1.6	1.7	2.7
22	2.1	2.5	e1.1	1.7	1.3	4.0	2.3	2.0	2.1	1.6	1.7	2.6
23	2.1	2.3	e1.2	1.7	e1.2	2.7	2.3	2.1	2.0	1.6	1.7	2.6
24	3.0	2.3	e1.2	1.7	e1.2	2.3	2.4	2.0	1.9	1.7	1.6	2.6
25	4.2	2.2	e1.2	1.7	1.2	2.4	2.7	2.0	2.0	1.9	1.8	2.5
26	4.5	2.2	e1.3	1.7	1.2	3.1	2.5	2.3	2.1	1.9	5.9	2.5
27	3.4	2.6	e1.4	1.9	1.2	3.2	2.1	2.3	2.4	1.8	2.2	2.5
28	2.6	2.2	e1.5	1.7	1.3	3.1	3.5	2.3	2.0	1.7	1.9	2.5
29	2.5	2.0	e1.5	e1.6	---	3.1	2.2	2.5	1.9	1.6	1.6	2.5
30	2.4	1.9	e1.5	e1.6	---	2.6	2.2	2.7	1.7	1.5	1.7	2.5
31	3.2	---	e1.5	e1.7	---	1.4	---	3.1	---	1.4	2.3	---
TOTAL	70.4	71.4	47.3	51.9	38.8	80.1	82.1	74.0	81.7	50.52	59.4	75.3
MEAN	2.27	2.38	1.53	1.67	1.39	2.58	2.74	2.39	2.72	1.63	1.92	2.51
MAX	4.5	4.1	2.0	1.9	1.8	4.0	4.0	3.2	6.6	2.4	5.9	6.8
MIN	1.5	1.9	1.0	1.5	1.1	1.4	1.4	1.8	1.5	.82	1.4	1.5
AC-FT	140	142	94	103	77	159	163	147	162	100	118	149

CAL YR 1989 TOTAL 12429.6 MEAN 34.1 MAX 849 MIN 1.0 AC-FT 24650
WTR YR 1990 TOTAL 782.92 MEAN 2.14 MAX 6.8 MIN .82 AC-FT 1550

e Estimated

05059700 MAPLE RIVER NEAR ENDERLIN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
13...	1355	1.8	1680	--	21.0	11.5	--	--	--	--	--	--
NOV												
29...	1250	2.0	1500	--	--	2.5	--	--	--	--	--	--
JAN												
18...	1200	1.7	1520	--	-3.5	0.5	--	--	--	--	--	--
MAR												
06...	1600	1.7	1510	--	0.5	1.0	--	--	--	--	--	--
APR												
02...	1645	1.4	1520	8.2	6.5	4.0	650	170	55	93	23	2
26...	1435	2.8	1660	--	14.0	8.0	--	--	--	--	--	--
JUN												
04...	1420	6.4	1540	--	12.5	17.5	--	--	--	--	--	--
JUL												
11...	1400	2.4	1530	8.2	24.5	23.5	690	170	64	110	25	2
SEP												
25...	0855	2.5	1940	--	19.5	18.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	9.9	430	0	350	460	53	0.30	23	1080	1080	1.47
JUL											
11...	12	430	0	354	490	77	0.20	18	1190	1160	1.62

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	4.20	3	220	30	1	120	1000	0.2	21	<1	770
JUL											
11...	7.81	6	330	30	<1	120	730	<1.0	2	<1	880

05060500 RUSH RIVER AT AMENIA, ND

LOCATION.--Lat 47°01'00", long 97°12'50", in SE¼NW¼ sec.24, T.141 N., R.52 W., Cass County, Hydrologic Unit 09020204, on left bank on downstream side of bridge on State Highway 18, 0.6 mi north of Amenia.

DRAINAGE AREA.--116 mi².

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 943 ft above National Geodetic Vertical Datum of 1929, from topographic map. See WSP 1913 for history of changes prior to June 10, 1961.

REMARKS.--Estimated daily discharges: Oct. 1-12, Nov. 8 to Mar. 30, and Sept. 4-25. Records good except those for March, which are poor.

AVERAGE DISCHARGE.--44 years, 9.32 ft³/s, 6,752 acre-ft/yr; median of yearly mean discharges, 6.2 ft³/s, 4,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,490 ft³/s, Apr. 19, 1979, gage height, 10.37 ft; maximum gage height, 12.15 ft, Mar. 23, 1966, backwater from ice; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 27 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 4	1030	64	6.01	July 6	0745	41	5.66
June 24	1145	39	5.64				

No flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.45	.00	e.00	e.00	e.00	e.00	6.7	5.1	1.0	18	.09	.00
2	e.40	.00	e.00	e.00	e.00	e.00	11	5.9	2.2	14	.08	.00
3	e.30	.00	e.00	e.00	e.00	e.00	11	7.2	6.5	11	.05	.00
4	e.25	.00	e.00	e.00	e.00	e.00	9.8	6.5	59	10	.01	e.00
5	e.20	.00	e.00	e.00	e.00	e.00	7.7	5.4	55	21	.00	e.00
6	e.15	.00	e.00	e.00	e.00	e.30	6.9	4.7	44	39	.00	e.00
7	e.10	.00	e.00	e.00	e.00	.42	7.7	3.5	36	29	.00	e.00
8	e.08	e.00	e.00	e.00	e.00	.35	7.4	2.9	31	20	.00	e.00
9	e.06	e.00	e.00	e.00	e.00	.40	6.0	2.4	24	14	.00	e.00
10	e.04	e.00	e.00	e.00	e.00	.54	4.8	1.9	19	10	.00	e.00
11	e.02	e.00	e.00	e.00	e.00	.99	4.0	1.4	15	6.9	.00	e.00
12	e.03	e.00	e.00	e.00	e.00	3.0	3.2	1.4	12	5.0	.00	e.00
13	.02	e.00	e.00	e.00	e.00	2.3	3.1	1.2	10	3.5	.00	e.00
14	.03	e.00	e.00	e.00	e.00	3.6	2.7	1.3	9.5	2.6	.00	e.00
15	.03	e.00	e.00	e.00	e.00	e2.5	2.6	1.1	19	2.1	.00	e.00
16	.03	e.00	e.00	e.00	e.00	e1.8	1.3	2.1	15	1.5	.00	e.00
17	.03	e.00	e.00	e.00	e.00	e1.5	2.8	9.0	11	1.1	.00	e.00
18	.02	e.00	e.00	e.00	e.00	e1.2	1.9	6.9	9.6	.85	.00	e.00
19	.02	e.00	e.00	e.00	e.00	e.90	1.4	4.7	9.3	.70	.00	e.00
20	.02	e.00	e.00	e.00	e.00	e.70	1.4	3.9	10	.68	.00	e.00
21	.02	e.00	e.00	e.00	e.00	e.50	1.4	4.3	9.5	.63	.00	e.00
22	.02	e.00	e.00	e.00	e.00	e.20	1.4	3.9	10	.55	.00	e.00
23	.02	e.00	e.00	e.00	e.00	e.10	1.3	3.1	24	.54	.00	e.00
24	.01	e.00	e.00	e.00	e.00	e.10	1.7	2.3	39	.41	.00	e.00
25	.01	e.00	e.00	e.00	e.00	e.20	2.4	1.7	35	.28	.00	e.00
26	.01	e.00	e.00	e.00	e.00	e.50	2.9	1.2	29	.28	.00	.00
27	.00	e.00	e.00	e.00	e.00	e.70	3.4	1.5	25	.30	.00	.00
28	.00	e.00	e.00	e.00	e.00	e.90	4.1	1.3	24	.28	.00	.00
29	.00	e.00	e.00	e.00	---	e1.2	5.6	.94	20	.20	.00	.00
30	.00	e.00	e.00	e.00	---	e1.8	5.3	.70	18	.15	.00	.00
31	.00	---	e.00	e.00	---	2.3	---	.90	---	.13	.00	---
TOTAL	2.37	0.00	0.00	0.00	0.00	29.00	132.9	100.34	631.6	214.68	0.23	0.00
MEAN	.076	.000	.000	.000	.000	.94	4.43	3.24	21.1	6.93	.007	.000
MAX	.45	.00	.00	.00	.00	3.6	11	9.0	59	.39	.09	.00
MIN	.00	.00	.00	.00	.00	.00	1.3	.70	1.0	.13	.00	.00
AC-FT	4.7	.00	.00	.00	.00	58	264	199	1250	426	.5	.00

CAL YR 1989 TOTAL 3347.10 MEAN 9.17 MAX 537 MIN .00 AC-FT 6640
WTR YR 1990 TOTAL 1111.12 MEAN 3.04 MAX 59 MIN .00 AC-FT 2200

e Estimated

05060500 RUSH RIVER AT AMENIA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
12...	1315	0.01	735	--	21.0	8.5	--	--	--	--	--	--
MAR												
06...	1030	0.10	875	--	1.0	1.0	--	--	--	--	--	--
13...	1345	4.0	770	--	4.5	1.0	--	--	--	--	--	--
28...	1140	0.90	1130	--	-0.5	1.5	--	--	--	--	--	--
30...	1255	1.6	915	8.1	16.0	1.5	320	82	29	62	28	1
APR												
19...	1625	1.5	830	--	23.0	11.0	--	--	--	--	--	--
JUN												
08...	0930	31	1300	8.3	12.5	17.0	520	130	48	48	16	0.9
13...	1310	10	1110	--	21.0	23.0	--	--	--	--	--	--
JUL												
11...	1145	7.1	925	--	22.0	24.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	17	230	0	180	240	40	0.20	15	616	597	0.84
JUN											
08...	12	330	0	256	340	19	0.30	23	822	781	1.12

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
30...	2.61	3	180	70	1	66	310	0.2	3	<1	490
JUN											
08...	69.0	9	230	30	<1	110	30	<0.1	<1	<1	550

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 47°21'10", long 96°50'50", on line between secs.24 and 25, T.145 N., R.49 W., Traill County, Hydrologic Unit 09020107, on left bank on upstream side of highway bridge, 0.5 mi west of Halstad, 2.5 mi downstream from Wild Rice River, and at mile 375.2.

DRAINAGE AREA.--21,800 mi^2, approximately, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--WSP 1388: 1936, 1950. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 826.65 ft above National Geodetic Vertical Datum of 1929. Prior to July 17, 1961, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 26 to Nov. 2 and Nov. 15 to Apr. 9. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--29 years (1961-90), 1,750 ft^3/s, 1,275,000 acre-ft/yr; median of yearly mean discharges, 1,760 ft^3/s, 1,280,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft^3/s, Apr. 22, 1979, gage height, 39.00 ft; minimum observed, 5.4 ft^3/s, Oct. 8, 9, 12-14, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of about 38.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,880 ft^3/s, Apr. 10, gage height, 8.55 ft; maximum gage height, 12.59 ft, Apr. 4, backwater from ice; minimum daily discharge, 100 ft^3/s, Dec. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	396	e292	e200	e108	e120	e190	e900	1190	892	1060	322	348
2	339	e287	e180	e107	e115	e195	e990	1230	1350	968	303	312
3	303	284	e170	e106	e115	e200	e1100	1290	2160	926	296	297
4	280	285	e160	e105	e125	e195	e1270	1320	2580	923	293	295
5	282	309	e160	e105	e125	e185	e1450	1320	2360	902	289	300
6	313	314	e155	e105	e135	e190	e1750	1300	2000	871	276	292
7	336	289	e150	e105	e145	e185	e2000	1260	1730	828	268	291
8	339	276	e148	e110	e155	e185	e2300	1230	1570	765	254	281
9	339	283	e145	e110	e155	e185	e2400	1200	1450	696	235	301
10	342	320	e140	e120	e155	e195	2440	1180	1380	672	215	306
11	335	345	e135	e118	e160	e200	1790	1140	1360	666	207	295
12	327	345	e132	e115	e170	e205	1570	1070	1430	653	223	276
13	315	334	e130	e115	e168	e215	1420	1000	1550	655	257	241
14	302	332	e128	e120	e164	e250	1290	955	1510	652	278	204
15	288	e320	e125	e120	e162	e300	1200	966	1340	623	276	176
16	274	e300	e122	e118	e160	e320	1070	1030	1210	570	270	167
17	276	e290	e120	e118	e160	e290	984	1060	1140	520	267	183
18	283	e280	e120	e117	e160	e270	915	1080	1060	482	283	223
19	271	e290	e118	e117	e160	e280	858	1110	1030	472	284	247
20	264	e310	e110	e117	e180	e300	832	1130	1140	478	283	272
21	263	e290	e105	e120	e200	e320	811	1140	1550	482	264	286
22	267	e280	e100	e125	e195	e322	806	1110	1680	505	237	258
23	275	e270	e102	e130	e190	e330	825	1080	1630	547	225	247
24	289	e260	e105	e128	e180	e370	850	1090	1500	580	225	229
25	303	e250	e108	e125	e180	e410	865	1070	1360	581	232	214
26	e316	e250	e109	e130	e180	e470	873	1030	1270	547	242	207
27	e312	e230	e110	e130	e180	e520	875	1010	1190	500	258	204
28	e308	e220	e110	e135	e190	e600	922	1010	1150	459	302	223
29	e312	e210	e110	e140	---	e660	993	985	1160	408	309	244
30	e305	e200	e110	e130	---	e730	1130	956	1140	368	308	262
31	e298	---	e109	e120	---	e800	---	922	---	340	345	---
TOTAL	9452	8545	4026	3669	4484	10067	37479	34464	43872	19699	8326	7681
MEAN	305	285	130	118	160	325	1249	1112	1462	635	269	256
MAX	396	345	200	140	200	800	2440	1320	2580	1060	345	348
MIN	263	200	100	105	115	185	806	922	892	340	207	167
AC-FT	18750	16950	7990	7280	8890	19970	74340	68360	87020	39070	16510	15240

CAL YR 1989 TOTAL 647491 MEAN 1774 MAX 25600 MIN 100 AC-FT 1284000
WTR YR 1990 TOTAL 191764 MEAN 525 MAX 2580 MIN 100 AC-FT 380400

e Estimated

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-67, 1972 to current year.

REMARKS.--Additional radiation and radionuclide data were not available at printing. These data will be available from files at the Bismarck District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
20...	1405	262	805	8.6	15.0	6.0	3.4	12.0	97	5	20
DEC											
19...	1220	119	1120	7.8	-25.0	0.0	3.5	11.8	--	--	--
JAN											
19...	1130	117	1230	--	-1.0	0.5	--	--	--	--	--
APR											
11...	1325	1780	522	8.3	2.5	2.5	89	10.5	77	K9	200
MAY											
31...	1055	926	--	8.3	25.5	22.0	60	7.9	--	K9	K50
JUL											
23...	1030	610	600	8.2	28.0	27.0	100	7.2	91	K63	K49
SEP											
06...	1035	293	570	--	22.5	22.0	--	--	--	--	--
28...	1055	223	700	--	10.5	12.5	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
OCT											
20...	350	71	42	41	20	1	9.1	249	251	282	12
DEC											
19...	480	96	58	55	20	1	10	350	355	433	0
APR											
11...	230	51	24	15	12	0.4	6.6	185	189	222	5
MAY											
31...	270	56	32	22	15	0.6	6.1	238	240	283	5
JUL											
23...	240	49	29	26	18	0.7	6.0	230	213	260	0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT											
20...	180	29	0.20	8.5	537	534	0.73	380	0.350	0.030	0.380
DEC											
19...	190	34	0.30	14	695	674	0.95	223	--	<0.010	0.490
APR											
11...	42	13	<0.10	13	321	281	0.44	1540	0.390	0.010	0.400
MAY											
31...	73	16	<0.10	5.6	379	362	0.52	948	1.47	0.030	1.50
JUL											
23...	61	22	0.30	15	364	339	0.50	600	0.390	0.010	0.400

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
OCT 20...	0.050	0.030	1.1	0.220	0.160	0.150	<10	3	71	<0.5
DEC 19...	1.00	0.500	2.1	0.250	0.200	0.200	--	--	--	--
APR 11...	0.270	0.120	1.4	0.290	0.050	0.040	20	2	48	<0.5
MAY 31...	0.220	0.020	1.3	0.340	0.190	0.180	--	--	--	--
JUL 23...	0.190	0.030	1.5	0.340	0.160	0.150	40	5	62	<0.5

DATE	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)
OCT 20...	<1.0	<1	<3	2	30	<1	43	3	<0.1	10
APR 11...	1.0	<1	<3	3	56	<1	19	34	<0.1	10
JUL 23...	<1.0	2	<3	6	48	<1	27	5	<0.1	<10

DATE	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DISSOLVED (UG/L AS U) (22703)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 20...	4	<1	<1.0	300	<6	9	--	13	9.2	95
DEC 19...	--	--	--	--	--	--	--	9	2.9	62
APR 11...	3	<1	<1.0	170	<6	4	--	192	923	99
MAY 31...	--	--	--	--	--	--	--	166	415	100
JUL 23...	2	<1	<1.0	200	<6	10	1.7	305	502	100

05064900 BEAVER CREEK NEAR FINLEY, ND
(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, Hydrologic Unit 09020109, on right bank 500 ft upstream from bridge on county highway, and 7 mi northeast of Finley.

DRAINAGE AREA.--160 mi², approximately.

WATER-DISCHARGE RECORDS

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 National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 25-29, Apr. 27-29, and July 1-28. Records fair except those for periods of estimated daily discharges, which are poor. Flow affected since June, 1987, by flood-control dam 2.0 mi upstream.

AVERAGE DISCHARGE.--26 years, 8.58 ft³/s, 6,220 acre-ft/yr; median of yearly mean discharges, 8.1 ft³/s, 5,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,900 ft³/s, Apr. 19, 1979, gage height, 8.35 ft, backwater from ice; maximum gage height, 9.70 ft, Mar. 14, 1966, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9.7 ft³/s, June 30, gage height, 2.67 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	2.1	.24	.19	e3.5	.00	.00
2	.00	.00	.00	.00	.00	.00	2.8	.25	.61	e1.5	.00	.00
3	.00	.00	.00	.00	.00	.00	2.4	.24	1.2	e1.0	.00	.00
4	.00	.00	.00	.00	.00	.00	1.5	.22	1.0	e.70	.00	.00
5	.00	.00	.00	.00	.00	.00	2.5	.20	1.2	e.50	.00	.00
6	.00	.00	.00	.00	.00	.00	1.9	.18	1.1	e.40	.00	.00
7	.00	.00	.00	.00	.00	.00	2.1	.19	1.1	e.30	.00	.00
8	.00	.00	.00	.00	.00	.00	1.4	.15	1.1	e.50	.00	.00
9	.00	.00	.00	.00	.00	.00	1.6	.11	.88	e.40	.00	.00
10	.00	.00	.00	.00	.00	.00	1.1	.08	.71	e.60	.00	.00
11	.00	.00	.00	.00	.00	.00	.89	.08	.63	e.45	.00	.00
12	.00	.00	.00	.00	.00	.03	.76	.11	1.5	e.30	.00	.00
13	.00	.00	.00	.00	.00	.06	.56	.10	1.4	e.25	.00	.00
14	.00	.00	.00	.00	.00	.07	.48	.10	2.4	e.20	.00	.00
15	.00	.00	.00	.00	.00	.06	.40	.09	2.2	e.17	.00	.00
16	.00	.00	.00	.00	.00	.36	.34	.11	1.7	e.15	.00	.00
17	.00	.00	.00	.00	.00	.43	.25	.15	1.5	e.25	.00	.00
18	.00	.00	.00	.00	.00	.41	.23	.17	1.2	e.20	.00	.00
19	.00	.00	.00	.00	.00	.27	.13	.13	1.5	e.17	.00	.00
20	.00	.00	.00	.00	.00	.23	.05	.13	1.2	e.30	.00	.00
21	.00	.00	.00	.00	.00	.09	.06	.10	1.1	e.20	.00	.00
22	.00	.00	.00	.00	.00	.00	.05	.08	1.6	e.15	.00	.00
23	.00	.00	.00	.00	.00	.00	.04	.08	2.4	e.10	.00	.00
24	.00	.00	.00	.00	.00	.00	.03	.08	2.2	e.07	.00	.00
25	.00	.00	.00	.00	.00	e.00	.06	.06	1.7	e.05	.00	.00
26	.00	.00	.00	.00	.00	e.00	.04	.13	1.3	e.03	.00	.00
27	.00	.00	.00	.00	.00	e.00	e.10	.19	1.3	e.02	.00	.00
28	.00	.00	.00	.00	.00	e.20	e1.0	.17	1.4	e.01	.00	.00
29	.00	.00	.00	.00	---	e.40	e.75	.11	4.1	.00	.00	.00
30	.00	.00	.00	.00	---	.66	.26	.09	8.0	.00	.00	.00
31	.00	---	.00	.00	---	4.4	---	.14	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	7.67	25.88	4.26	49.42	12.47	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.25	.86	.14	1.65	.40	.000	.000
MAX	.00	.00	.00	.00	.00	4.4	2.8	.25	8.0	3.5	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.03	.06	.19	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	15	51	8.4	98	25	.00	.00

CAL YR 1989 TOTAL 2150.07 MEAN 5.89 MAX 190 MIN .00 AC-FT 4260
WTR YR 1990 TOTAL 99.70 MEAN .27 MAX 8.0 MIN .00 AC-FT 198

e Estimated

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

REMARKS.--Additional radiation and radionuclide data were not available at printing. These data will be available from files at the Bismarck District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
MAR											
13...	1640	0.05	--	--	8.0	3.0	--	--	--	--	--
APR											
09...	1200	1.5	940	8.3	3.5	2.0	2.5	8.6	64	K5	K33
30...	1210	0.26	1180	--	0.5	5.5	--	--	--	--	--
MAY											
30...	0840	0.10	1460	8.3	18.0	17.5	2.6	7.4	77	66	75
JUN											
27...	0950	1.2	990	--	23.5	22.5	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
APR											
09...	350	82	36	53	24	1	15	146	146	178	0
MAY											
30...	540	120	59	110	30	2	14	258	267	325	0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
APR											
09...	290	23	<0.10	11	698	603	0.95	2.83	0.930	0.070	1.00
MAY											
30...	470	43	0.20	9.3	1010	987	1.37	0.27	--	<0.010	<0.100

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)
APR											
09...	0.080	0.080	1.9	0.250	0.070	0.040	20	2	32	<0.5	<1.0
MAY											
30...	0.050	0.040	1.2	0.130	0.080	0.070	<10	3	28	<0.5	<1.0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
APR											
09...	<5	<3	<10	63	<10	53	370	<0.1	<10	<10	<1
MAY											
30...	<1	<3	1	20	<1	94	440	0.1	<10	3	<1

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SILVER, DIS-SOLVED (UG/I AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR											
09...	<1.0	350	<6	19	--	--	--	--	5	0.02	89
MAY											
30...	<1.0	620	<6	10	<0.4	<0.4	<0.4	0.20	12	0.00	90

05066500 GOOSE RIVER AT HILLSBORO, ND

LOCATION.--Lat 47°24'34", long 97°03'39", in NW¼ sec.5, T.145 N., R.50 W., Traill County, Hydrologic Unit 09020109, on right bank 600 ft upstream from Foogman Dam in Hillsboro, and 27.5 mi upstream from mouth.

DRAINAGE AREA.--1,203 mi^2, of which about 110 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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 National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Oct. 22-25, Nov. 23, 24, Dec. 19 to Mar. 11, Mar. 18-22, May 25 to July 18, and Aug. 25 to Sept. 30. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--57 years (1931-32, 1934-90), 70.8 ft^3/s, 51,290 acre-ft/yr; median of yearly mean discharges, 43 ft^3/s, 31,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/s, Apr. 21, 1979, gage height, 16.76 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 6	2230	*94	*2.01				

No flow Oct. 26 to Nov. 21, Dec. 13 to Jan. 7, and Sept. 1-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	.00	1.6	e.00	e1.5	e1.1	21	13	e7.6	e10	14	e.00
2	.91	.00	1.4	e.00	e1.5	e1.2	19	12	e7.8	e9.6	14	e.00
3	.89	.00	.53	e.00	e1.3	e1.3	53	12	e7.8	e9.2	8.8	e.00
4	.86	.00	.41	e.00	e1.4	e1.4	76	12	e7.8	e9.0	8.5	e.00
5	.64	.00	.36	e.00	e1.4	e1.2	52	13	e7.8	e9.0	10	e.00
6	.41	.00	.29	e.00	e1.4	e1.2	69	14	e7.8	e9.0	9.6	e.00
7	.28	.00	.20	e.00	e1.4	e1.3	69	15	e7.8	e10	3.2	e.00
8	.27	.00	.25	e.10	e1.4	e1.4	54	15	e7.8	e11	1.7	e.00
9	.37	.00	.28	e.20	e1.4	e1.4	46	15	e7.8	e11	3.7	e.00
10	.35	.00	.24	e.30	e1.4	e1.5	39	15	e7.8	e11	2.9	e.00
11	.36	.00	.18	e.40	e1.4	e1.7	31	13	e7.8	e11	5.7	e.00
12	.42	.00	.15	e.60	e1.4	3.5	30	12	e7.8	e12	5.6	e.00
13	.49	.00	.00	e.70	e1.4	3.3	24	13	e7.8	e12	4.6	e.00
14	.46	.00	.00	e.80	e1.3	7.4	15	12	e7.9	e13	2.8	e.00
15	.74	.00	.00	e.90	e1.2	4.2	8.7	10	e8.0	e13	3.9	e.00
16	.95	.00	.00	e1.0	e1.1	2.5	7.8	9.7	e8.0	e12	3.2	e.00
17	.95	.00	.00	e1.1	e1.0	.96	3.9	8.4	e8.0	e11	2.9	e.00
18	.95	.00	.00	e1.1	e1.0	e.90	4.4	8.0	e8.0	e11	4.6	e.00
19	.95	.00	e.00	e1.2	e1.0	e1.0	4.4	9.7	e8.4	13	6.7	e.00
20	.95	.00	e.00	e1.3	e1.0	e1.1	2.3	9.7	e9.0	16	8.5	e.00
21	.95	.00	e.00	e1.4	e1.0	e1.3	1.5	8.7	e9.0	14	4.0	e.00
22	e1.0	.26	e.00	e1.5	e1.0	e1.4	.53	8.9	e9.0	20	1.0	e.00
23	e1.0	e1.0	e.00	e1.5	e1.0	2.0	1.5	10	e9.0	23	.33	e.00
24	e1.0	e1.5	e.00	e1.5	e1.0	1.9	3.9	9.2	e10	22	.46	e.00
25	e.50	2.3	e.00	e1.5	e1.0	2.2	10	e6.6	e10	21	e.16	e.00
26	.00	2.1	e.00	e1.5	e1.0	2.9	13	e6.6	e11	16	e.14	e.00
27	.00	2.1	e.00	e1.5	e1.0	3.1	13	e6.6	e11	26	e.12	e.00
28	.00	2.1	e.00	e1.5	e1.0	4.4	11	e6.6	e11	24	e.08	e.00
29	.00	1.7	e.00	e1.5	---	3.6	13	e7.0	e11	17	e.06	e.00
30	.00	1.7	e.00	e1.5	---	6.3	14	e7.4	e10	15	e.04	e.00
31	.00	---	e.00	e1.5	---	11	---	e7.6	---	10	e.02	---
TOTAL	17.60	14.76	5.89	26.10	33.9	79.66	710.93	326.7	259.5	430.8	131.31	0.00
MEAN	.57	.49	.19	.84	1.21	2.57	23.7	10.5	8.65	13.9	4.24	.000
MAX	1.0	2.3	1.6	1.5	1.5	11	76	15	11	26	14	.00
MIN	.00	.00	.00	.00	1.0	.90	.53	6.6	7.6	9.0	.02	.00
AC-FT	35	29	12	52	67	158	1410	648	515	854	260	.00

CAL YR 1989 TOTAL 26587.85 MEAN 72.8 MAX 2660 MIN .00 AC-FT 52740
WTR YR 1990 TOTAL 2037.15 MEAN 5.58 MAX 76 MIN .00 AC-FT 4040

e Estimated

05066500 GOOSE RIVER AT HILLSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
20...	1125	0.82	1540	--	8.0	6.0	--	--	--	--	--	--
DEC												
01...	1340	1.7	1800	--	2.5	2.5	--	--	--	--	--	--
JAN												
19...	1230	1.0	2550	--	-1.0	1.0	--	--	--	--	--	--
MAR												
13...	1045	3.6	2850	--	2.0	0.5	--	--	--	--	--	--
28...	1355	4.5	2760	--	3.0	2.5	--	--	--	--	--	--
APR												
02...	1420	15	2040	7.4	2.0	3.0	510	120	51	240	50	5
25...	1300	11	1730	--	11.0	13.0	--	--	--	--	--	--
JUN												
01...	1100	7.3	1000	8.2	23.5	21.0	380	90	38	68	27	2
JUL												
18...	1045	11	1600	--	23.0	23.0	--	--	--	--	--	--
AUG												
31...	1230	0.02	1830	--	19.5	22.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	18	290	0	230	480	210	0.60	16	1330	1280	1.81
JUN											
01...	9.6	250	0	205	270	50	0.30	2.9	669	653	0.91

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	52.1	4	500	70	<1	110	1200	0.2	2	1	930
JUN											
01...	13.3	4	190	10	<1	59	30	<0.1	<1	<1	510

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

LOCATION.--Lat 47°55'38", long 97°01'34", in sec.2, T.151 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on the right bank, 200 ft upstream from the DeMers Avenue bridge, 0.4 mi downstream from Red Lake River, and at mile 293.8.

DRAINAGE AREA.--30,100 mi^2, approximately, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1882 to current year. Prior to January 1904 monthly discharge only, published in WSP 1308.

REVISED RECORDS.--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. WRD-ND-81-1: 1882, 1897 (M).

GAGE.--Water-stage recorder. Datum of gage is 779.00 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1983, to Sept. 30, 1986, datum of gage was 780.00 ft at same site. Apr. 14, 1965, to Sept. 30, 1983, water-stage recorder 1.9 mi downstream at a datum of 778.35 ft. Nov. 3, 1933, to Apr. 13, 1965, water-stage recorder 0.3 mi upstream at 778.35 ft datum. See WSP 1728 or 1913 for history of changes prior to Nov. 3, 1933.

REMARKS.--Estimated daily discharges: Dec. 20 to Mar. 12. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--86 years (water year 1905-90), 2,581 ft^3/s, 1,870,000 acre-ft/yr; median of yearly mean discharge, 2,270 ft^3/s, 1,645,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 85,000 ft^3/s, Apr. 10, 1897, gage height, 50.2 ft, site and datum then in use, from rating curve extended above 54,000 ft^3/s; minimum, 1.8 ft^3/s, Sept. 2, 1977, caused by unusual regulation during repair of dam at Grand Forks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,040 ft^3/s, Apr. 5, gage height, 17.56 ft; minimum daily, 110 ft^3/s, Dec. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	607	439	446	e143	e265	e332	2160	1490	1220	1680	608	447
2	617	425	439	e147	e256	e323	3270	1560	1330	1590	570	468
3	595	400	433	e151	e265	e323	4310	1630	2040	1430	534	461
4	559	402	413	e155	e273	e323	4880	1660	2770	1300	503	403
5	500	424	412	e155	e273	e340	4860	1700	3190	1240	514	415
6	469	462	400	e159	e273	e350	4590	1700	3170	1210	519	411
7	500	482	383	e163	e273	e376	4240	1690	2900	1180	491	419
8	525	487	391	e159	e273	e385	3910	1650	2560	1200	482	395
9	544	474	370	e163	e256	e412	3820	1590	2290	1120	477	375
10	577	464	351	e159	e239	e440	3910	1570	2090	1020	443	375
11	548	457	336	e163	e231	e477	3490	1550	1920	953	428	383
12	570	508	299	e163	e231	e594	2900	1540	1820	926	402	385
13	560	513	269	e168	e223	611	2570	1480	1830	889	406	362
14	545	517	239	e168	e231	754	2460	1410	1920	870	416	354
15	505	451	218	e152	e231	1060	2280	1350	1970	857	484	284
16	506	301	203	e152	e223	1780	2040	1270	1840	861	474	268
17	465	277	200	e168	e207	2300	1710	1310	1680	831	431	231
18	458	349	194	e176	e215	2130	1560	1370	1580	785	436	265
19	466	396	163	e192	e223	1790	1400	1420	1550	740	433	288
20	452	437	e144	e200	e239	1580	1340	1490	1440	705	448	331
21	440	482	e130	e207	e248	1440	1310	1540	1560	689	450	335
22	427	511	e116	e215	e239	1410	1270	1580	2010	701	432	374
23	427	483	e116	e223	e239	1480	1240	1580	2510	707	395	422
24	465	447	e110	e223	e256	1550	1190	1560	2640	741	362	375
25	471	423	e115	e231	e344	1590	1200	1530	2530	776	383	354
26	486	426	e120	e240	e350	1520	1170	1520	2310	805	405	330
27	464	453	e124	e248	e323	1440	1160	1480	2120	791	393	311
28	436	472	e135	e248	e332	1450	1250	1440	1980	744	377	295
29	440	470	e139	e265	---	1470	1390	1320	1820	685	414	276
30	448	446	e143	e256	---	1470	1400	1310	1740	662	459	310
31	439	---	e143	e276	---	1580	---	1260	---	642	460	---
TOTAL	15511	13278	7694	5888	7231	33080	74280	46550	62330	29330	14029	10702
MEAN	500	443	248	190	258	1067	2476	1502	2078	946	453	357
MAX	617	517	446	276	350	2300	4880	1700	3190	1680	608	468
MIN	427	277	110	143	207	323	1160	1260	1220	642	362	231
AC-FT	30770	26340	15260	11680	14340	65610	147300	92330	123600	58180	27830	21230

CAL YR 1989 TOTAL 959808 MEAN 2630 MAX 39500 MIN 110 AC-FT 1904000
WTR YR 1990 TOTAL 319903 MEAN 876 MAX 4880 MIN 110 AC-FT 634500

e Estimated

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949, 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
27...	1610	444	500	--	5.0	4.0	--	--	--	--	--	--
DEC												
27...	1550	130	985	--	-2.0	0.0	--	--	--	--	--	--
JAN												
26...	1125	240	1040	--	3.0	1.0	--	--	--	--	--	--
FEB												
27...	1500	312	865	--	0.0	0.5	--	--	--	--	--	--
APR												
13...	1150	2560	462	8.2	7.5	1.0	210	48	22	14	12	0.4
17...	1600	1640	495	--	10.0	3.5	--	--	--	--	--	--
23...	1725	1270	510	--	28.0	14.0	--	--	--	--	--	--
MAY												
29...	1445	1350	565	--	27.0	19.0	--	--	--	--	--	--
JUN												
25...	1440	2490	575	--	32.0	24.0	--	--	--	--	--	--
JUL												
27...	1520	794	608	--	30.5	26.0	--	--	--	--	--	--
AUG												
30...	1230	458	625	8.5	29.5	24.5	260	52	32	22	15	0.6
SEP												
28...	1430	293	623	--	15.0	15.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
13...	6.7	210	0	170	64	13	0.10	13	279	283	0.38
AUG											
30...	4.5	200	24	210	70	20	0.20	8.1	364	334	0.50

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
13...	1930	2	50	60	<1	16	20	0.1	2	1	250
AUG											
30...	450	5	90	20	<1	22	10	0.1	4	<1	280

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND

LOCATION.--Lat 48°14'50", long 98°07'00", in SE¼NW¼ sec.16, T.135 N., R.58 W., Walsh County, Hydrologic Unit 09020308, 150 ft downstream from bridge on State Highway 35, and 6 mi north of Whitman.

DRAINAGE AREA.--47.7 mi², of which about 9 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,510 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 31 to Apr. 17. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--30 years, 2.73 ft³/s, 1,980 acre-ft/yr; median of yearly mean discharges, 2.1 ft³/s, 1,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 984 ft³/s, May 19, 1974, gage height, 7.11 ft; maximum gage height, 7.96 ft Apr. 4, 1987; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 3	unknown	a*7.0	unknown	No other peak greater than base discharge.			

No flow for several months.
a - About

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e2.5	.44	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	e5.0	.43	.07	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	e6.0	.40	.33	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	e5.5	.34	.39	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	e5.1	.32	.24	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	e4.7	.29	.14	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	e4.3	.23	.10	.02	.00	.00
8	.00	.00	.00	.00	.00	.00	e3.9	.20	.13	.10	.00	.00
9	.00	.00	.00	.00	.00	.00	e3.5	.21	.12	.48	.00	.00
10	.00	.00	.00	.00	.00	.00	e3.0	.22	.09	.19	.00	.00
11	.00	.00	.00	.00	.00	.00	e2.8	.20	.05	.10	.00	.00
12	.00	.00	.00	.00	.00	.00	e2.5	.17	.06	.06	.00	.00
13	.00	.00	.00	.00	.00	.00	e2.3	.14	.11	.03	.00	.00
14	.00	.00	.00	.00	.00	.00	e2.0	.12	.04	.01	.00	.00
15	.00	.00	.00	.00	.00	.00	e1.8	.09	.02	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	e1.5	.14	.01	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	e1.3	.20	.06	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	1.0	.19	.13	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	1.0	.17	.14	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.95	.12	.14	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.89	.09	.10	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.83	.06	.07	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.71	.04	.04	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.64	.02	.03	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.65	.01	.01	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.57	.03	.01	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.46	.04	.03	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.46	.02	.03	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.47	.01	.02	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.52	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	e1.0	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1.00	66.85	4.94	2.71	0.99	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.032	2.23	.16	.090	.032	.000	.000
MAX	.00	.00	.00	.00	.00	1.0	6.0	.44	.39	.48	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.46	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	2.0	133	9.8	5.4	2.0	.00	.00

CAL YR 1989 TOTAL 141.57 MEAN .39 MAX 29 MIN .00 AC-FT 281
WTR YR 1990 TOTAL 76.49 MEAN .21 MAX 6.0 MIN .00 AC-FT 152

e Estimated

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1990 to June 1990.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
APR												
02...	1050	4.9	655	7.6	1.5	1.5	220	53	20	44	30	1
10...	1405	3.0	565	--	-0.5	8.5	--	--	--	--	--	--
MAY												
11...	1300	0.22	835	--	10.5	10.5	--	--	--	--	--	--
JUN												
11...	1440	0.02	2200	--	24.5	20.5	--	--	--	--	--	--
12...	1245	0.05	2150	7.9	23.5	23.5	770	160	89	220	38	3

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	11	110	0	90	210	17	0.10	9.8	427	422	0.58
JUN											
12...	15	260	0	216	870	71	0.20	15	1680	1570	2.28

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	5.64	<1	30	60	<1	18	460	0.1	2	<1	300
12...	0.23	3	130	50	<1	79	10	1.0	3	<1	790

05084000 FOREST RIVER NEAR FORDVILLE, ND

LOCATION.--Lat 48°11'50", long 97°43'49", on line between secs.32 and 33, T.155 N., R.55 W., Walsh County, Hydrologic Unit 09020308, on right bank 50 ft upstream from highway bridge, 0.5 mi downstream from South Branch, and 3 mi southeast of Fordville.

DRAINAGE AREA.--456 mi^2, of which about 120 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1940 to September 1990 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,035 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 21, 1951, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 30 to Apr. 23. Records good except those for period of estimated daily discharges, which are poor. 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-ft.

AVERAGE DISCHARGE.--50 years, 37.0 ft^3/s, 26,810 acre-ft/yr; median of yearly mean discharges, 34 ft^3/s, 24,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft^3/s, Apr. 18, 1950, gage height, 14.48 ft, from floodmark, from rating curve extended above 5,600 ft^3/s on basis of contracted opening and slope-area measurements of peak flow; no flow Apr. 1-13, Sept. 3, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17 ft^3/s, June 3, gage height, 1.67 ft; minimum daily discharge, 0.76 ft^3/s, Aug. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	5.5	e9.0	e5.0	e4.6	e4.6	e7.5	11	6.6	5.5	1.4	2.2
2	5.7	6.5	e9.5	e5.0	e4.6	e4.6	e8.0	12	13	5.2	1.3	2.2
3	5.8	5.8	e10	e5.0	e4.6	e4.6	e8.5	11	16	5.0	.95	2.1
4	5.8	6.9	e10	e5.0	e4.5	e4.6	e9.3	11	14	4.8	.87	2.0
5	6.1	6.8	e10	e5.0	e4.5	e4.6	e11	10	12	4.5	.76	2.2
6	6.0	6.2	e10	e5.0	e4.5	e4.6	e12	10	10	4.4	.78	2.4
7	6.4	5.9	e10	e5.0	e4.5	e4.7	e13	8.3	8.8	4.7	2.1	2.5
8	7.0	5.6	e10	e5.3	e4.5	e4.8	e14	7.2	11	8.1	1.9	2.4
9	7.2	5.9	e10	e5.3	e4.4	e4.9	e15	8.5	8.4	6.8	1.7	2.2
10	7.0	5.6	e10	e5.3	e4.4	e5.0	e15	7.7	7.0	11	1.4	2.2
11	7.4	4.8	e9.0	e5.2	e4.4	e5.0	e15	7.0	6.5	8.2	1.8	2.1
12	7.1	5.8	e8.0	e5.2	e4.4	e4.9	e15	6.9	6.6	6.5	2.5	1.9
13	7.0	5.0	e7.0	e5.2	e4.3	e4.8	e15	8.0	7.1	5.8	2.2	2.1
14	6.9	5.2	e6.5	e5.1	e4.2	e4.7	e14	8.2	6.7	5.4	1.7	2.2
15	7.2	5.0	e5.5	e5.1	e4.0	e4.6	e14	7.0	6.4	4.9	1.4	1.9
16	7.6	4.5	e4.5	e5.1	e4.0	e4.5	e14	8.4	6.2	4.7	1.2	1.7
17	7.6	5.1	e3.5	e5.0	e4.1	e4.5	e14	11	7.0	4.9	.99	1.9
18	7.8	11	e4.0	e5.0	e4.3	e4.5	e14	10	8.1	4.7	.88	3.0
19	8.4	14	e4.5	e5.0	e4.4	e4.5	e13	9.3	7.3	4.7	1.1	2.7
20	13	13	e4.7	e4.9	e4.5	e4.5	e13	8.9	7.3	4.4	.96	2.6
21	13	12	e5.0	e4.9	e4.5	e4.5	e13	9.3	7.2	4.2	1.0	2.6
22	13	12	e5.0	e4.8	e4.5	e4.5	e13	8.8	6.9	3.9	1.0	2.5
23	13	12	e5.0	e4.8	e4.5	e4.5	e13	8.1	6.4	3.5	.98	2.6
24	13	13	e5.0	e4.7	e4.6	e4.6	13	8.0	6.0	3.5	1.6	2.6
25	12	12	e5.0	e4.7	e4.6	e4.6	13	8.2	5.8	3.3	4.8	3.0
26	12	12	e5.0	e4.7	e4.6	e5.0	12	8.3	5.8	3.1	4.4	3.1
27	13	11	e5.0	e4.6	e4.6	e5.4	11	8.8	5.9	2.7	4.2	3.3
28	13	10	e5.0	e4.6	e4.6	e5.8	12	8.4	5.7	2.5	3.4	3.3
29	13	9.6	e5.0	e4.3	---	e6.1	12	8.3	5.4	2.1	2.6	3.9
30	12	e9.3	e5.0	e3.9	---	e6.5	11	7.8	5.1	1.8	2.3	3.7
31	5.7	---	e5.0	e4.2	---	e7.0	---	7.0	---	1.6	2.4	---
TOTAL	275.4	247.0	210.7	151.9	124.2	152.0	377.3	272.4	236.2	146.4	56.57	75.1
MEAN	8.88	8.23	6.80	4.90	4.44	4.90	12.6	8.79	7.87	4.72	1.82	2.50
MAX	13	14	10	5.3	4.6	7.0	15	12	16	11	4.8	3.9
MIN	5.7	4.5	3.5	3.9	4.0	4.5	7.5	6.9	5.1	1.6	.76	1.7
AC-FT	546	490	418	301	246	301	748	540	469	290	112	149

CAL YR 1989 TOTAL 4717.5 MEAN 12.9 MAX 134 MIN 2.0 AC-FT 9360
WTR YR 1990 TOTAL 2325.17 MEAN 6.37 MAX 16 MIN .76 AC-FT 4610

e Estimated

05084000 FOREST RIVER NEAR FORDVILLE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	1315	5.6	740	--	6.5	7.0	--	--	--	--	--	--
NOV												
27...	1050	11	1010	--	-12.0	0.5	--	--	--	--	--	--
JAN												
08...	1215	5.3	845	--	4.5	0.5	--	--	--	--	--	--
MAR												
01...	1010	4.6	659	--	6.0	2.0	--	--	--	--	--	--
29...	0935	6.1	632	8.0	9.0	6.5	300	77	26	19	12	0.5
MAY												
11...	1000	8.0	680	--	6.5	14.0	--	--	--	--	--	--
JUN												
18...	1240	8.3	675	--	24.0	23.5	--	--	--	--	--	--
JUL												
30...	1525	2.1	645	8.5	24.0	23.0	290	66	30	24	15	0.6
SEP												
04...	1515	1.9	642	--	25.5	22.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
29...	5.2	290	0	240	100	7.4	0.20	23	398	401	0.54
JUL											
30...	3.8	230	0	192	120	11	0.20	18	433	389	0.59

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
29...	6.53	1	50	20	<1	22	220	0.2	2	1	290
JUL											
30...	2.41	3	50	30	<1	27	100	0.1	1	1	300

05085000 FOREST RIVER AT MINTO, ND

LOCATION.--Lat 48°16'10", long 97°22'10", in SE¼ sec.51, T.156 N., R.52 W., Walsh County, Hydrologic Unit 09020308, on right bank 30 ft upstream from dam in Minto, 150 ft upstream from Burlington Northern Railway bridge, and 900 ft east of U.S. Highway 81.

DRAINAGE AREA.--740 mi², of which about 120 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1438: 1948-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 806.95 ft above National Geodetic Vertical Datum of 1929. Prior to July 15, 1954, nonrecording gage at site 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Mar. 12-29. Records good except those for period of estimated daily discharges, which are fair. Occasionally during high stages, particularly when the channel is filled with snow, overflow occurs 0.5 mi below the municipality of Forest River and bypasses the gage 3 mi south of Minto and flows into Lake Ardoch. Bypass flow is not included in computation of discharge record for station at Minto.

AVERAGE DISCHARGE.--46 years, 48.1 ft³/s, 34,850 acre-ft/yr; median of yearly mean discharges, 39 ft³/s, 28,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,600 ft³/s, Apr. 18, 1950, gage height, 11.80 ft from floodmarks, from rating curve extended above 7,200 ft³/s, on basis of contracted opening measurement of peak flow; no flow at times each year 1945-47, 1953-55, 1959-64, 1977, 1985, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 15	1645	*58	*1.56				

No flow Oct. 1-12, Dec. 20 to Mar. 13, and Aug. 5 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	5.5	.95	.00	.00	.00	11	21	6.3	7.3	.23	.00
2	.00	3.7	.94	.00	.00	.00	8.5	19	9.2	6.1	.23	.00
3	.00	3.2	.75	.00	.00	.00	12	18	9.1	5.5	.12	.00
4	.00	2.6	.73	.00	.00	.00	19	16	9.8	4.7	.02	.00
5	.00	2.1	.88	.00	.00	.00	23	15	17	3.5	.00	.00
6	.00	1.9	.75	.00	.00	.00	27	15	16	3.1	.00	.00
7	.00	2.5	.58	.00	.00	.00	30	15	15	3.4	.00	.00
8	.00	2.7	.53	.00	.00	.00	26	14	14	4.6	.00	.00
9	.00	2.4	.57	.00	.00	.00	28	12	13	3.8	.00	.00
10	.00	2.2	.45	.00	.00	.00	26	12	10	4.2	.00	.00
11	.00	1.7	.39	.00	.00	.00	20	9.6	7.9	4.4	.00	.00
12	.00	1.3	.34	.00	.00	e.00	22	9.2	7.6	3.1	.00	.00
13	.03	1.2	.29	.00	.00	e.00	22	9.1	6.6	2.6	.00	.00
14	.32	1.3	.24	.00	.00	e.5	30	8.8	5.5	2.9	.00	.00
15	.78	1.1	.21	.00	.00	e1.0	27	8.8	5.5	3.1	.00	.00
16	1.1	.92	.20	.00	.00	e1.0	26	9.4	6.2	3.1	.00	.00
17	1.2	.94	.12	.00	.00	e.9	28	11	5.8	3.2	.00	.00
18	1.6	.91	.09	.00	.00	e.8	26	11	5.4	2.7	.00	.00
19	1.9	.91	.01	.00	.00	e.8	31	11	5.6	2.0	.00	.00
20	1.5	.95	.00	.00	.00	e.8	38	11	6.2	1.7	.00	.00
21	1.5	1.0	.00	.00	.00	e.8	38	10	6.3	1.6	.00	.00
22	1.3	1.1	.00	.00	.00	e.7	41	9.1	6.6	1.4	.00	.00
23	1.6	1.4	.00	.00	.00	e.6	38	8.3	6.6	1.5	.00	.00
24	2.4	1.3	.00	.00	.00	e.6	38	8.4	6.7	1.4	.00	.00
25	3.2	1.3	.00	.00	.00	e.6	34	8.3	6.2	.82	.00	.00
26	2.6	1.5	.00	.00	.00	e.5	28	8.8	5.8	.88	.00	.00
27	2.7	1.4	.00	.00	.00	e1.0	23	8.3	6.2	.77	.00	.00
28	3.2	1.1	.00	.00	.00	e1.1	26	8.4	7.1	.51	.00	.00
29	2.6	.94	.00	.00	---	e1.3	20	8.3	6.9	.46	.00	.00
30	3.1	.93	.00	.00	---	1.5	27	7.5	8.4	.42	.00	.00
31	3.8	---	.00	.00	---	4.1	---	7.0	---	.34	.00	---
TOTAL	36.43	52.00	9.02	0.00	0.00	18.60	793.5	348.3	248.5	85.10	0.60	0.00
MEAN	1.18	1.73	.29	.000	.000	.60	26.4	11.2	8.28	2.75	.019	.000
MAX	3.8	5.5	.95	.00	.00	4.1	41	21	17	7.3	.23	.00
MIN	.00	.91	.00	.00	.00	.00	8.5	7.0	5.4	.34	.00	.00
AC-FT	72	103	18	.00	.00	37	1570	691	493	169	1.2	.00

CAL YR 1989 TOTAL 4209.25 MEAN 11.5 MAX 297 MIN .00 AC-FT 8350
WTR YR 1990 TOTAL 1592.05 MEAN 4.36 MAX 41 MIN .00 AC-FT 3160

05085000 FOREST RIVER AT MINTO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
14...	1615	1.2	810	--	2.0	2.0	--	--	--	--	--	--
MAR												
28...	1440	1.1	775	--	4.5	3.0	--	--	--	--	--	--
APR												
05...	1210	20	540	8.2	-2.0	1.0	210	51	19	19	16	0.6
MAY												
10...	1617	12	465	--	13.0	9.5	--	--	--	--	--	--
JUN												
20...	1730	5.9	732	--	22.0	22.5	--	--	--	--	--	--
JUL												
30...	1135	0.37	820	8.1	21.5	23.5	310	68	35	45	23	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	5.6	190	0	160	82	18	0.20	16	303	306	0.41
JUL											
30...	6.6	300	0	244	130	38	0.20	26	531	496	0.72

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
05...	16.1	1	50	20	<1	17	160	0.1	1	<1	270
JUL											
30...	0.53	7	110	30	1	35	<10	0.1	2	<1	370

05088500 HOMME RESERVOIR NEAR PARK RIVER, ND

LOCATION.--Lat 48°24'20", long 97°47'10", in $SE^1/_4NW^1/_4$ sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, at Homme Dam on South Branch Park River, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi^2.

MONTHEND-ELEVATION AND CONTENTS RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

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 U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 4,710 acre-ft, Apr. 20, 1979, elevation, 1,084.58 ft; minimum since first reaching spillway level, 184 acre-ft, Feb. 8, 1952, elevation, 1,051.22 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,890 acre-ft, Apr. 9, elevation, 1,080.27 ft; minimum, 2,570 acre-ft, Sept. 28, elevation, 1,078.47 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,079.29	2,710	--
Oct. 31	1,079.20	2,700	-10
Nov. 30	1,079.56	2,760	+60
Dec. 31	1,079.75	2,800	+40
CAL YR 1989	--	--	+570
Jan. 31	1,079.93	2,830	+30
Feb. 28	1,079.72	2,790	-40
Mar. 31	1,080.20	2,880	+90
Apr. 30	1,079.98	2,840	-40
May 31	1,079.60	2,770	-70
June 30	1,079.51	2,750	-20
July 31	1,079.17	2,690	-60
Aug. 31	1,078.80	2,630	-60
Sept. 30	1,078.47	2,570	-60
WTR YR 1990	--	--	-140

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND

LOCATION.--Lat 48°24'07", long 97°46'55", in SE$^1/_4$ sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, on right bank 0.5 mi downstream from Homme Dam, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 9-16, Feb. 13 to Apr. 5. Records fair. Flow regulated by Homme Reservoir (station 05088500).

AVERAGE DISCHARGE.--41 years, 24.5 ft^3/s, 17,750 acre-ft/yr; median of yearly mean discharges, 20 ft^3/s, 14,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 13,000 ft^3/s, Apr. 24, 1950, gage height, 37.52 ft, from rating curve extended above 5,500 ft^3/s, result of failure of emergency embankment at site of Homme Dam; no flow at times during 1949, 1969, 1970, 1974, 1988, 1989, and 1990 water years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 24 ft^3/s, Apr. 5, gage height, 23.46 ft; maximum gage height, 24.17 ft, Apr. 1, backwater from ice; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.07	.07	.00	.00	e.00	e2.5	.39	1.4	.07	.00	.00
2	.00	.07	.07	.00	.00	e.00	e3.0	.30	1.5	.07	.00	.00
3	.00	.07	.03	.00	.00	e.00	e4.4	.27	1.4	.07	.00	.00
4	.00	.10	.03	.00	.00	e.00	e8.0	.29	1.5	.07	.00	.00
5	.02	.12	.06	.00	.00	e.00	e10	.29	1.8	.04	.00	.00
6	.04	.13	.04	.00	.00	e.00	11	.51	1.8	.03	.00	.00
7	.05	.14	.01	.00	.00	e.00	9.0	1.1	1.8	.04	.00	.00
8	.06	.18	.00	.00	.00	e.00	7.1	.76	1.9	.16	.00	.00
9	.06	.14	e.00	.00	.00	e.00	6.8	.40	2.0	.11	.00	.00
10	.07	.14	e.00	.00	.00	e.00	5.3	.42	2.1	.07	.00	.00
11	.07	.30	e.00	.00	.00	e.00	3.7	2.6	2.2	.06	.00	.00
12	.07	.20	e.00	.00	.00	e.00	2.9	4.1	2.1	.03	.00	.00
13	.07	.14	e.00	.00	e.00	e.00	2.4	3.8	2.0	.02	.00	.00
14	.07	.12	e.00	.00	e.00	e.00	2.9	3.8	1.9	.02	.00	.00
15	.07	.10	e.00	.00	e.00	e.00	2.4	3.9	1.3	.00	.00	.00
16	.07	.08	e.00	.00	e.00	e.00	2.2	2.6	.43	.00	.00	.00
17	.07	.07	.00	.00	e.00	e.00	1.6	.73	.41	.00	.00	.00
18	.07	.03	.00	.00	e.00	e.00	4.5	.44	.38	.00	.00	.00
19	.07	.05	.00	.00	e.00	e.00	6.8	.39	.37	.00	.00	.00
20	.07	.08	.00	.00	e.00	e.00	4.7	.37	.41	.00	.00	.00
21	.07	.08	.00	.00	e.00	e.00	3.6	.45	.22	.00	.00	.00
22	.07	.08	.00	.00	e.00	e.00	3.6	.50	.14	.00	.00	.00
23	.03	.07	.00	.00	e.00	e.00	1.6	.60	.09	.00	.00	.00
24	.02	.07	.00	.00	e.00	e.00	.31	.74	.07	.00	.00	.00
25	.03	.07	.00	.00	e.00	e.00	.31	.82	.07	.00	.00	.00
26	.04	.07	.00	.00	e.00	e.00	.24	.88	.07	.00	.00	.00
27	.06	.04	.00	.00	e.00	e.00	.26	.98	.16	.00	.00	.00
28	.06	.01	.00	.00	e.00	e.00	.76	1.2	.16	.00	.00	.00
29	.06	.03	.00	.00	---	e.00	.86	1.1	.11	.00	.00	.00
30	.06	.04	.00	.00	---	e.80	.95	.96	.08	.00	.00	.00
31	.07	---	.00	.00	---	e1.6	---	1.2	---	.00	.00	---
TOTAL	1.57	2.89	0.31	0.00	0.00	2.40	113.69	36.89	29.87	0.86	0.00	0.00
MEAN	.051	.096	.010	.000	.000	.077	3.79	1.19	1.00	.028	.000	.000
MAX	.07	.30	.07	.00	.00	1.6	11	4.1	2.2	.16	.00	.00
MIN	.00	.01	.00	.00	.00	.00	.24	.27	.07	.00	.00	.00
AC-FT	3.1	5.7	.6	.00	.00	4.8	226	73	59	1.7	.00	.00

CAL YR 1989 TOTAL 783.16 MEAN 2.15 MAX 55 MIN .00 AC-FT 1550
WTR YR 1990 TOTAL 188.48 MEAN .52 MAX 11 MIN .00 AC-FT 374

e Estimated

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
27...	1210	0.03	905	--	-11.5	0.5	--	--	--	--	--	--
APR												
03...	1730	4.4	--	--	10.0	1.5	--	--	--	--	--	--
09...	1020	7.3	782	8.3	8.0	6.5	320	78	31	40	21	1
MAY												
10...	1315	0.38	405	--	10.0	8.5	--	--	--	--	--	--
JUN												
18...	1645	0.40	895	--	28.5	26.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	8.0	220	0	180	210	14	0.20	1.7	516	494	0.70

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
09...	10.1	2	110	20	1	43	330	0.2	2	1	420

05090000 PARK RIVER AT GRAFTON, ND

LOCATION.--Lat 48°25'29", long 97°24'42", in NE$^1/_4$ sec.13, T.157 N., R.53 W., Walsh County, Hydrologic Unit 09020310, on right bank at the upstream corner of U.S. Highway 81 bridge in Grafton, and 3.5 mi downstream from South Branch.

DRAINAGE AREA.--695 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 811.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1984, gage located on right bank 30 ft upstream of Wakeman Avenue bridge. Datum of gage was 807.39 ft. 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 mi downstream above masonry dam at same datum. Sept. 18, 1946, to July 25, 1952, nonrecording gage at site 30 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 16 to Aprl 4. Records good except those below 1 ft^3/s, which are fair. Flow regulated by Homme Reservoir (station 05088500) and several small reservoirs.

AVERAGE DISCHARGE.--59 years, 55.2 ft^3/s, 39,990 acre-ft/yr; median of yearly mean discharges, 40 ft^3/s, 29,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft^3/s, Apr. 19, 1950, gage height, 20.13 ft, from rating curve extended above 9,000 ft^3/s; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 24 ft^3/s, Apr. 21, gage height, 7.28 ft; no flow, Oct. 1-26, Jan. 11 to Mar. 11, and June 25 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.17	e.17	e.01	e.00	e.00	e5.2	4.3	.04	.00	.00	.00
2	.00	.34	e.17	e.02	e.00	e.00	e3.4	6.2	.64	.00	.00	.00
3	.00	.50	e.17	e.06	e.00	e.00	e4.1	7.3	.03	.00	.00	.00
4	.00	1.4	e.20	e.05	e.00	e.00	e4.5	6.7	4.0	.00	.00	.00
5	.00	1.8	e.20	e.02	e.00	e.00	1.1	5.1	4.5	.00	.00	.00
6	.00	1.7	e.22	e.02	e.00	e.00	2.1	4.7	2.6	.00	.00	.00
7	.00	1.8	e.17	e.02	e.00	e.00	5.6	4.4	1.0	.00	.00	.00
8	.00	1.2	e.17	e.05	e.00	e.00	8.6	4.3	3.2	.00	.00	.00
9	.00	.50	e.17	e.06	e.00	e.00	17	.93	3.0	.00	.00	.00
10	.00	.61	e.17	e.03	e.00	e.00	14	.98	3.7	.00	.00	.00
11	.00	.46	e.17	e.00	e.00	e.00	14	.12	2.9	.00	.00	.00
12	.00	.17	e.07	e.00	e.00	e.05	13	.19	3.0	.00	.00	.00
13	.00	.17	e.08	e.00	e.00	e.10	12	1.1	3.2	.00	.00	.00
14	.00	.19	e.10	e.00	e.00	e.24	11	11	3.1	.00	.00	.00
15	.00	.09	e.09	e.00	e.00	e.64	10	12	3.6	.00	.00	.00
16	.00	e.01	e.10	e.01	e.00	e.50	8.1	14	3.1	.00	.00	.00
17	.00	e.03	e.10	e.12	e.00	e.17	9.4	15	3.1	.00	.00	.00
18	.00	e.05	e.05	e.08	e.00	e.15	8.9	12	3.1	.00	.00	.00
19	.00	e.16	e.01	e.01	e.00	e.11	10	7.1	1.1	.00	.00	.00
20	.00	e.17	e.04	e.01	e.00	e.05	16	4.4	.73	.00	.00	.00
21	.00	e.32	e.02	e.00	e.00	e.05	22	2.5	.23	.00	.00	.00
22	.00	e.19	e.07	e.00	e.00	e.05	17	7.4	.04	.00	.00	.00
23	.00	e.17	e.01	e.00	e.00	e.04	15	4.6	.01	.00	.00	.00
24	.00	e.17	e.02	e.00	e.00	e.03	14	.51	.01	.00	.00	.00
25	.00	e.17	e.02	e.00	e.00	e.03	12	.05	.00	.00	.00	.00
26	.00	e.10	e.01	e.00	e.00	e.02	7.7	.04	.00	.00	.00	.00
27	.01	e.05	e.01	e.00	e.00	e.03	5.1	.03	.00	.00	.00	.00
28	.02	e.05	e.02	e.00	e.00	e.06	6.8	.03	.00	.00	.00	.00
29	.02	e.05	e.05	e.00	---	e.60	6.0	.01	.00	.00	.00	.00
30	.03	e.17	e.03	e.00	---	e3.0	4.5	.01	.00	.00	.00	.00
31	.07	---	e.01	e.00	---	e5.2	---	.01	---	.00	.00	---
TOTAL	0.15	12.96	2.89	0.57	0.00	11.12	288.1	137.01	49.93	0.00	0.00	0.00
MEAN	.005	.43	.093	.018	.000	.36	9.60	4.42	1.66	.000	.000	.000
MAX	.07	1.8	.22	.12	.00	5.2	22	15	4.5	.00	.00	.00
MIN	.00	.01	.01	.00	.00	.00	1.1	.01	.00	.00	.00	.00
AC-FT	.3	26	5.7	1.1	.00	22	571	272	99	.00	.00	.00

CAL YR 1989 TOTAL 1458.41 MEAN 4.00 MAX 129 MIN .00 AC-FT 2890
WTR YR 1990 TOTAL 502.73 MEAN 1.38 MAX 22 MIN .00 AC-FT 997

e Estimated

05090000 PARK RIVER AT GRAFTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
14...	1455	0.10	740	--	1.0	3.5	--	--	--	--	--	--
JAN												
03...	1150	0.08	2450	--	-4.0	0.5	--	--	--	--	--	--
APR												
05...	1000	0.59	2200	8.7	-2.0	1.0	270	57	31	330	72	9
MAY												
11...	1055	0.53	1880	--	15.0	12.5	--	--	--	--	--	--
JUN												
20...	1610	2.2	1900	--	20.0	23.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	12	330	0	270	200	360	0.80	10	1220	1170	1.66

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
05...	1.94	3	830	40	1	80	430	0.1	<1	<1	490

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND

LOCATION.--Lat 48°34'20", long 97°08'50", in $SE^1/_4SE^1/_4SE^1/_4$ sec.24, T.159 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on downstream end of east pier of interstate highway bridge, 1.5 mi northeast of Drayton, and at mile 206.7.

DRAINAGE AREA.--34,800 mi^2, approximately, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1388: 1949-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 755.00 ft above National Geodetic Vertical Datum of 1929 (Minnesota highway benchmark). Prior to Nov. 30, 1954, nonrecording gage at site 1.5 mi upstream at datum 1.59 ft higher.

REMARKS.--Estimated daily discharges: Nov. 26 to Feb. 27. Records good. Some regulation by reservoirs on tributaries.

AVERAGE DISCHARGE.--41 years (water years 1950-90), 3,746 ft^3/s, 2,714,000 acre-ft/yr; median of yearly mean discharges, 2,930 ft^3/s, 2,123,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 92,900 ft^3/s, Apr. 28, 1979, gage height, 43.66 ft; minimum observed, 7.7 ft^3/s, Oct. 16, 1936, gage height, 1.75 ft, former site and datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1897 reached a stage of about 41 ft, at site and datum in use prior to Nov. 30, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,080 ft^3/s, Apr. 7, gage height, 15.54 ft; minimum daily discharge, 110 ft^3/s, Dec. 29-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	411	446	e460	e125	e250	291	2170	1460	1350	1860	731	396
2	495	460	e460	e125	e260	300	2230	1460	1310	1770	683	438
3	529	455	e445	e125	e260	302	2650	1510	1370	1700	626	432
4	521	459	e445	e125	e270	307	4010	1590	1530	1620	568	410
5	502	464	e440	e130	e270	311	4300	1650	1980	1520	535	446
6	480	461	e435	e138	e260	323	4600	1700	2520	1410	473	403
7	473	433	e420	e138	e260	338	5000	1710	2790	1340	435	410
8	432	436	e410	e148	e270	371	5000	1710	2790	1360	421	391
9	410	484	e400	e156	e270	372	4860	1680	2660	1340	408	390
10	461	493	e395	e161	e280	370	4650	1650	2430	1310	397	395
11	461	482	e390	e165	e270	376	4580	1600	2240	1240	416	364
12	504	487	e380	e166	e270	426	4370	1580	2060	1150	421	352
13	513	474	e360	e170	e260	462	4230	1530	1940	1070	395	344
14	516	477	e345	e170	e240	539	3880	1510	1850	1030	350	362
15	521	474	e330	e170	e230	629	3730	1480	1840	990	360	341
16	528	437	e290	e170	e230	670	2650	1410	1870	975	344	356
17	512	399	e265	e170	e230	742	2360	1350	1890	957	356	333
18	507	408	e240	e170	e230	1130	2150	1360	1850	974	436	295
19	483	412	e230	e170	e230	1880	1920	1360	1740	986	464	284
20	449	408	e220	e170	e220	2350	1770	1380	1660	952	418	285
21	450	414	e200	e175	e220	2460	1630	1410	1620	847	401	294
22	444	431	e160	e175	e220	2330	1540	1470	1580	807	394	318
23	464	436	e110	e190	e230	2110	1470	1500	1640	768	383	372
24	475	467	e150	e199	e240	1950	1400	1530	1930	749	387	372
25	458	475	e140	e202	e250	1910	1380	1540	2230	746	420	404
26	472	e480	e140	e215	e257	1910	1350	1540	2370	778	386	408
27	465	e460	e130	e218	e280	1910	1350	1510	2340	818	374	364
28	431	e435	e120	e230	293	1880	1390	1480	2210	838	375	339
29	448	e430	e110	e240	---	1860	1410	1450	2090	841	379	317
30	448	e450	e110	e250	---	1860	1420	1400	1980	838	372	317
31	443	---	e110	e250	---	1950	---	1380	---	788	368	---
TOTAL	14706	13527	8840	5406	7050	34619	85450	46890	59660	34372	13476	10932
MEAN	474	451	285	174	252	1117	2848	1513	1989	1109	435	364
MAX	529	493	460	250	293	2460	5000	1710	2790	1860	731	446
MIN	410	399	110	125	220	291	1350	1350	1310	746	344	284
AC-FT	29170	26830	17530	10720	13980	68670	169500	93010	118300	68180	26730	21680

CAL YR 1989 TOTAL 1077204 MEAN 2951 MAX 41800 MIN 110 AC-FT 2137000
WTR YR 1990 TOTAL 334928 MEAN 918 MAX 5000 MIN 110 AC-FT 664300

e Estimated

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
05...	1200	512	610	--	5.0	6.5	--	--	--	--	--	--
NOV												
06...	1200	485	980	--	6.0	2.0	--	--	--	--	--	--
DEC												
29...	1200	111	1050	--	-16.0	0.0	--	--	--	--	--	--
FEB												
26...	1110	259	1010	--	1.0	0.5	--	--	--	--	--	--
APR												
16...	1230	2520	740	7.8	1.5	3.5	230	52	24	48	30	1
20...	1320	1740	705	--	21.0	7.0	--	--	--	--	--	--
MAY												
11...	1430	1570	900	--	14.5	14.0	--	--	--	--	--	--
JUN												
20...	1405	1640	560	--	21.0	22.0	--	--	--	--	--	--
JUL												
23...	1250	766	985	8.6	29.0	25.0	330	68	38	79	34	2
SEP												
07...	1550	418	800	--	26.5	24.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
16...	9.1	200	0	160	89	67	0.20	13	408	399	0.55
JUL											
23...	9.8	320	0	258	120	110	0.20	16	624	597	0.85

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
16...	2780	2	100	140	1	29	30	0.1	4	1	350
JUL											
23...	1290	8	170	60	<1	46	10	0.2	3	<1	460

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND
(International gaging station)

LOCATION.--Lat 48°57'10", long 99°25'35", in SE¼SW¼ sec.11, T.163 N., R.68 W., Towner County, Hydrologic Unit 09020313, on right bank 400 ft downstream from bridge on county highway, and 2.5 mi west of Hansboro.

DRAINAGE AREA.--38 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,615 ft above National Geodetic Vertical Datum of 1929 from topographic map. Prior to May 20, 1962, nonrecording gage 400 ft upstream at same datum.

REMARKS.--Records fair.

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

AVERAGE DISCHARGE.--29 years, 3.09 ft³/s, 2,240 acre-ft/yr; median of yearly mean discharges, 2.1 ft³/s, 1,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 1,200 ft³/s Apr. 23, 1979, gage height, 10.50 ft, from floodmark, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 3	1845	*5.1	*5.79				

No flow most of the time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	2.5	.07	.02	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	1.7	.06	.07	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	3.3	.08	.20	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	4.3	.09	.09	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	2.6	.08	.06	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	2.8	.07	.04	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	2.4	.06	.03	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	1.9	.05	.03	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	1.4	.04	.03	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	1.1	.03	.02	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.89	.03	.02	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.74	.03	.01	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.68	.03	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.60	.03	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.51	.04	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.43	.16	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.29	.17	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.26	.11	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.25	.08	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.21	.07	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.19	.06	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.17	.06	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.13	.05	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.09	.04	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.18	.05	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.15	.03	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.08	.03	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.07	.03	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.04	.08	.02	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.1	.08	.02	.00	.00	.00	.00
31	.00	---	.00	.00	---	1.9	---	.02	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	3.04	30.08	1.79	0.62	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.098	1.00	.058	.021	.000	.000	.000
MAX	.00	.00	.00	.00	.00	1.9	4.3	.17	.20	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.07	.02	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	6.0	60	3.6	1.2	.00	.00	.00

CAL YR 1989 TOTAL 122.25 MEAN .33 MAX 20 MIN .00 AC-FT 242
WTR YR 1990 TOTAL 35.53 MEAN .097 MAX 4.3 MIN .00 AC-FT 70

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
APR												
04...	0945	4.3	376	7.5	-2.5	1.0	140	33	13	13	15	0.5
18...	1415	0.25	385	--	12.0	9.0	--	--	--	--	--	--
MAY												
09...	1340	0.01	585	--	8.5	7.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	16	130	0	110	61	7.6	0.10	15	241	224	0.33

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
04...	2.81	1	40	90	1	17	50	0.1	2	1	200

05098820 CYPRESS CREEK ABOVE INTERNATIONAL BOUNDARY NEAR SARLES, ND
(International gaging station)

LOCATION.--Lat 48°58'37", long 98°56'04", in NW¼NW¼ sec.3, T.163 N., R.64 W., Cavalier County, Hydrologic Unit 09020313, on right bank 12 ft downstream of bridge on State Highway 20, 4.5 mi northeast of Sarles.

DRAINAGE AREA.--83 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1, 1988, to current year. Records for May 1961 to Sept. 1988, published as Cypress Creek near Sarles, ND (station 05098800) at site 3 mi upstream, are not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,550 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 14 to Apr. 2 and Apr. 18 to June 14. Records fair.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum observed discharge at site 3 miles upstream, (station 05098800 Cypress Creek near Sarles, ND) 2,000 ft³/s, Apr. 21, 1979.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 258 ft³/s, Apr. 3, 1990, gage height, 14.50; maximum gage height, 15.29 ft, Apr. 1, 1990, ice jam.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (*).

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 1	2315	ice jam	*15.29	Apr. 3	1145	*258	14.50

No flow much of the time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e10	e.29	e.13	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	e100	e.29	e.12	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	164	e.30	e.11	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	99	e.30	e.10	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	38	e.30	e.09	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	34	e.30	e.08	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	38	e.30	e.07	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	29	e.30	e.06	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	17	e.32	e.05	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	9.0	e.27	e.04	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	4.8	e.27	e.03	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	3.4	e.27	e.02	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	3.2	e.29	e.01	.00	.00	.00
14	.00	.00	.00	.00	.00	e.01	2.7	e.29	e.13	.00	.00	.00
15	.00	.00	.00	.00	.00	e.01	2.3	e.29	e.01	.00	.00	.00
16	.00	.00	.00	.00	.00	e.01	1.8	e.28	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	e.02	1.5	e.28	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	e.03	e1.1	e.26	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	e.04	e1.0	e.26	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	e.04	e.85	e.26	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	e.05	e.75	e.25	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	e.04	e.65	e.24	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	e.03	e.60	e.23	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	e.02	e.55	e.22	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	e.02	e.50	e.20	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	e.02	e.31	e.19	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	e.02	e.29	e.18	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	e.03	e.30	e.17	.00	.00	.00	.00
29	.00	.00	.00	.00	---	e.20	e.27	e.16	.00	.00	.00	.00
30	.00	.00	.00	.00	---	e.30	e.28	e.15	.00	.00	.00	.00
31	.00	---	.00	.00	---	e1.0	---	e.14	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1.89	565.15	7.85	1.05	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.061	18.8	.25	.035	.000	.000	.000
MAX	.00	.00	.00	.00	.00	1.0	164	.32	.13	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.27	.14	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	3.7	1120	16	2.1	.00	.00	.00

CAL YR 1989 TOTAL 502.87 MEAN 1.38 MAX 80 MIN .00 AC-FT 997
WTR YR 1990 TOTAL 575.94 MEAN 1.58 MAX 164 MIN .00 AC-FT 1140

e Estimated

05098820 CYPRESS CREEK ABOVE INTERNATIONAL BOUNDARY NEAR SARLES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1989 to May 1989.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
MAR												
27...	1455	0.02	725	--	2.0	0.5	--	--	--	--	--	--
APR												
04...	1205	97	266	7.7	0.5	1.0	100	27	8.5	10	16	0.4
18...	1255	1.1	420	--	12.0	8.5	--	--	--	--	--	--
MAY												
09...	1535	0.32	725	--	--	--	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	6.2	110	0	90	39	2.0	0.10	15	153	162	0.21

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
04...	40.2	2	30	100	1	8	80	0.1	2	<1	200

05099100 SNOWFLAKE CREEK NEAR SNOWFLAKE, MAN
(International gaging station)

LOCATION.--Lat 49°01'17", long 98°36'13", in SW$^1/_4$ sec.10, T.1, R.9 W., 1st meridian, Hydrologic Unit 09020313, at traffic bridge, 2.5 mi east, and 1.5 mi south of Snowflake, Manitoba.

DRAINAGE AREA.--348 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder since March 1968 and nonrecording gage prior thereto. Datum of gage is Geodetic Survey of Canada Datum of 1929. Prior to Jan. 1, 1987, recording gage at same site at datum of 1221.66 ft above Geodetic Survey of Canada Datum of 1929. Prior to Apr. 2, 1964, nonrecording gage at present site and datum. Apr. 2, 1964, to May 10, 1965, nonrecording gage at site 0.5 mi downstream at present datum.

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

AVERAGE DISCHARGE.--29 years, 14.2 ft^3/s, 10,290 acre-ft/yr; median of yearly mean discharges, 7.4 ft^3/s, 5,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,130 ft^3/s, Apr. 21, 1979, gage height, 1,229.94 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 155 ft^3/s, Apr. 3, gage height, 1,226.57 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	e.00	e28	1.2	.00	8.8	.00	.00
2	.00	.00	.00	.00	.00	e.00	e24	.95	.11	8.1	.04	.00
3	.00	.00	.00	.00	.00	e.00	e68	1.1	.28	7.3	.00	.00
4	.00	.00	.00	.00	.00	e.00	e50	.99	.18	6.5	.00	.04
5	.00	.00	.00	.00	.00	e.00	e20	.92	.14	5.9	.00	.00
6	.00	.00	.00	.00	.00	e.00	20	.81	.11	5.0	.00	.00
7	.00	.00	.00	.00	.00	e.00	12	.64	.18	4.1	.00	.00
8	.00	.00	.00	.00	.00	e.00	14	.53	35	3.7	.00	.00
9	.00	.00	.00	.00	.00	e.00	14	.35	19	3.4	.00	.00
10	.00	.00	.00	.00	.00	e.00	10	.28	14	3.1	.00	.00
11	.00	.00	.00	.00	.00	e.00	5.3	.21	14	2.6	.00	.00
12	.00	.00	.00	.00	.00	e.00	7.1	.14	21	1.9	.00	.00
13	.00	.00	.00	.00	.00	e.00	10	.11	46	1.4	.00	.00
14	.00	.00	.00	.00	.00	e3.1	12	.11	29	1.2	.00	.00
15	.00	.00	.00	.00	.00	e4.0	33	.11	25	.95	.00	.00
16	.00	.00	.00	.00	.00	e.21	14	.53	25	.71	.00	.00
17	.00	.00	.00	.00	.00	e.46	8.7	.56	33	.56	.00	.00
18	.00	.00	.00	.00	.00	e1.5	5.9	.35	35	.46	.00	.00
19	.00	.00	.00	.00	.00	e.28	5.6	.28	28	.35	.00	.00
20	.00	.00	.00	.00	.00	e.21	6.6	.21	25	.25	.00	.00
21	.00	.00	.00	.00	.00	e.18	5.4	.18	23	.18	.00	.00
22	.00	.00	.00	.00	.00	e.18	5.2	.18	21	.11	.00	.00
23	.00	.00	.00	.00	e.04	e.14	3.2	.14	19	.07	.00	.00
24	.00	.00	.00	.00	e.18	e.18	12	.11	18	.04	.00	.00
25	.00	.00	.00	.00	e.07	e.18	14	.11	16	.04	.00	.00
26	.00	.00	.00	.00	e.00	e.21	7.0	.07	14	.04	.00	.00
27	.00	.00	.00	.00	e.00	e.25	3.5	.07	13	.00	.00	.00
28	.00	.00	.00	.00	e.00	e.67	2.4	.04	12	.00	.60	.00
29	.00	.00	.00	.00	---	e1.9	2.2	.04	11	.00	.21	.00
30	.00	.00	.00	.00	---	e14	1.6	.04	9.7	.00	.11	.00
31	.00	---	.00	.00	---	e19	---	.00	---	.00	.04	---
TOTAL	0.00	0.00	0.00	0.00	0.29	46.65	424.7	11.36	506.70	66.76	1.00	0.04
MEAN	.000	.000	.000	.000	.010	1.50	14.2	.37	16.9	2.15	.032	.001
MAX	.00	.00	.00	.00	.18	19	68	1.2	46	8.8	.60	.04
MIN	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.6	93	842	23	1010	132	2.0	.08

CAL YR 1989 TOTAL 763.68 MEAN 2.09 MAX 112 MIN .00 AC-FT 1510
WTR YR 1990 TOTAL 1057.50 MEAN 2.90 MAX 68 MIN .00 AC-FT 2100

e Estimated

05099150 MOWBRAY CREEK NEAR MOWBRAY, MAN
(International gaging station)

LOCATION.--Lat 49°00'00", long 98°27'15", in SE$^1/_4$ sec.3, T.1, R.8 W., 1st meridian, Hydrologic Unit 09020313, on downstream side of bridge on Municipal Road on international boundary, and 1.5 mi east of Mowbray, Manitoba.

DRAINAGE AREA.--93.9 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1962 to current year (seasonal records only most years).

GAGE.--Water-stage recorder operated March 1 to October 31 each year. Datum of gage is Geodetic Survey of Canada datum of 1929. Nonrecording gage prior to 1971.

COOPERATION.--Records furnished by the Water Survey of Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 943 ft^3/s, Apr. 6, 1987, gage height, 1,534.57 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 137 ft^3/s, Apr. 7, gage height, 1,531.64 ft, backwater from ice; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e42	3.1	.00	1.3	.00	.39
2	.00	.00	.00	.00	.00	.00	e31	3.5	.00	1.2	.00	.04
3	.00	.00	.00	.00	.00	.00	e73	4.2	.00	.98	.00	.00
4	.00	.00	.00	.00	.00	.00	e97	3.6	.00	.74	.00	.00
5	.00	.00	.00	.00	.00	.00	e87	2.9	.00	.63	.00	.00
6	.00	.00	.00	.00	.00	.00	e103	2.5	.00	.46	.00	.00
7	.00	.00	.00	.00	.00	.00	e116	2.4	.00	.60	.00	.00
8	.00	.00	.00	.00	.00	.00	e100	2.2	.11	.49	.00	.00
9	.00	.00	.00	.00	.00	.00	e51	2.0	56	.32	.00	.00
10	.00	.00	.00	.00	.00	e.00	e33	1.8	42	.14	.00	.00
11	.00	.00	.00	.00	.00	e.00	e14	1.6	30	.04	.00	.00
12	.00	.00	.00	.00	.00	e.00	e11	1.3	26	.04	.00	.00
13	.00	.00	.00	.00	.00	e5.9	e7.8	1.1	31	.04	.00	.00
14	.00	.00	.00	.00	.00	e2.2	e15	1.0	37	.00	.00	.00
15	.00	.00	.00	.00	.00	e.70	e27	.81	33	.00	.00	.00
16	.00	.00	.00	.00	.00	e.25	20	1.4	19	.00	.00	.00
17	.00	.00	.00	.00	.00	e.21	17	1.3	28	.00	.00	.00
18	.00	.00	.00	.00	.00	e.11	8.2	.98	51	.00	.00	.00
19	.00	.00	.00	.00	.00	e.04	6.5	.77	32	.00	.00	.00
20	.00	.00	.00	.00	.00	e.14	7.8	.63	18	.00	.00	.00
21	.00	.00	.00	.00	.00	e.91	5.6	.56	15	.00	.00	.00
22	.00	.00	.00	.00	.00	e1.1	15	.46	12	.00	.00	.00
23	.00	.00	.00	.00	.00	e.39	11	.28	8.0	.00	.00	.00
24	.00	.00	.00	.00	.00	e.35	9.1	.04	5.8	.00	.00	.00
25	.00	.00	.00	.00	.00	e.21	7.5	.00	4.4	.00	.00	.00
26	.00	.00	.00	.00	.00	e.14	5.9	.00	3.3	.00	.00	.00
27	.00	.00	.00	.00	.00	e.07	4.1	.00	2.7	.00	.00	.00
28	.00	.00	.00	.00	.00	e.11	3.6	.00	2.2	.00	.00	.00
29	.00	.00	.00	.00	---	e3.3	3.5	.00	1.8	.00	.14	.00
30	.00	.00	.00	.00	---	e30	3.3	.00	1.5	.00	1.9	.00
31	.00	---	.00	.00	---	e26	---	.00	---	.00	1.2	---
TOTAL	0.00	0.00	0.00	0.00	0.00	72.13	935.9	40.43	459.81	6.98	3.24	0.43
MEAN	.000	.000	.000	.000	.000	2.33	31.2	1.30	15.3	.23	.10	.014
MAX	.00	.00	.00	.00	.00	30	116	4.2	56	1.3	1.9	.39
MIN	.00	.00	.00	.00	.00	.00	3.3	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	143	1860	80	912	14	6.4	.9

CAL YR 1989 TOTAL 1082.03 MEAN 2.96 MAX 232 MIN .00 AC-FT 2150
WTR YR 1990 TOTAL 1518.92 MEAN 4.16 MAX 116 MIN .00 AC-FT 3010

e Estimated

05099300 PEMBINA RIVER NEAR WINDYGATES, MAN
(International gaging station)

LOCATION.--Lat 49°01'53", long 98°16'40", in SE¼ sec.13, T.1, R.7 W., 1st meridian, Hydrologic Unit 09020313, on left bank 0.2 mi downstream from bridge, and 3 mi northeast of Windygates, Manitoba.

DRAINAGE AREA.--3,020 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada datum of 1929. Prior to Jan. 1, 1985, datum of gage at 1102.02 ft above Geodetic Survey of Canada datum of 1929.

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

AVERAGE DISCHARGE.--28 years, 186 ft³/s, 134,800 acre-ft/yr; median of yearly mean discharges, 129 ft³/s, 9,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft³/s, Apr. 26, 1974, gage height, 1,121.52 ft; no flow in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 794 ft³/s, Apr. 3, gage height, 1,108.50 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e473	110	50	48	3.6	.07
2	.00	.00	.00	.00	.00	.00	424	106	53	77	3.5	.04
3	.00	.00	.00	.00	.00	.00	621	111	55	186	2.7	.07
4	.00	.00	.00	.00	.00	.00	646	108	53	65	2.3	.21
5	.00	.00	.00	.00	.00	.00	459	105	53	46	2.0	.07
6	.00	.00	.00	.00	.00	.00	338	102	55	39	1.9	.11
7	.00	.00	.00	.00	.00	.00	326	98	56	38	1.6	.11
8	.00	.00	.00	.00	.00	.00	315	93	67	33	1.3	.07
9	.00	.00	.00	.00	.00	e.14	253	87	70	30	1.0	.04
10	.00	.00	.00	.00	.00	e.07	181	84	99	27	.85	.04
11	.00	.00	.00	.00	.00	e.11	159	81	124	25	.99	.04
12	.00	.00	.00	.00	.00	e4.1	135	77	183	25	1.2	.04
13	.00	.00	.00	.00	.00	e3.2	144	72	197	29	1.0	.04
14	.00	.00	.00	.00	.00	e4.6	145	69	134	29	.88	.04
15	.00	.00	.00	.00	.00	e1.7	151	67	123	28	.64	.04
16	.00	.00	.00	.00	.00	e3.6	177	78	113	25	.56	.04
17	.00	.00	.00	.00	.00	e.85	161	85	e108	24	.46	.11
18	.00	.00	.00	.00	.00	e.53	156	78	e105	21	.67	.28
19	.00	.00	.00	.00	.00	e1.8	143	94	e101	19	.60	.14
20	.00	.00	.00	.00	.00	e.88	144	118	e97	17	.35	.18
21	.00	.00	.00	.00	.00	e.35	147	e109	e93	15	.28	.18
22	.00	.00	.00	.00	.00	e.07	137	e102	e89	13	.18	.11
23	.00	.00	.00	.00	.00	e.67	146	e95	e85	10	.11	.11
24	.00	.00	.00	.00	.00	e.07	145	e89	e82	8.8	.07	.11
25	.00	.00	.00	.00	.00	e.07	143	e82	78	7.4	.25	.07
26	.00	.00	.00	.00	.00	e.18	142	e76	75	6.4	.25	.11
27	.00	.00	.00	.00	.00	e.71	130	e70	69	5.8	.39	.11
28	.00	.00	.00	.00	.00	e5.6	129	e64	63	4.7	.28	.14
29	.00	.00	.00	.00	---	e7.8	123	e57	57	4.1	.18	.14
30	.00	.00	.00	.00	---	e63	117	55	52	3.5	.14	.14
31	.00	---	.00	.00	---	e406	---	52	---	3.2	.07	---
TOTAL	0.00	0.00	0.00	0.00	0.00	506.10	6910	2674	2639	912.9	30.30	3.00
MEAN	.000	.000	.000	.000	.000	16.3	230	86.3	88.0	29.4	.98	.10
MAX	.00	.00	.00	.00	.00	406	646	118	197	186	3.6	.28
MIN	.00	.00	.00	.00	.00	.00	117	52	50	3.2	.07	.04
AC-FT	.00	.00	.00	.00	.00	1000	13710	5300	5230	1810	60	6.0

CAL YR 1989 TOTAL 6647.74 MEAN 18.2 MAX 381 MIN .00 AC-FT 13190
WTR YR 1990 TOTAL 13675.30 MEAN 37.5 MAX 646 MIN .00 AC-FT 27120

e Estimated

05099600 PEMBINA RIVER AT WALHALLA, ND

LOCATION.--Lat 48°54'50", long 97°55'00", in NE¼NE¼ sec.29, T.163 N., R.56 W., Pembina County, Hydrologic Unit 09020313, on left bank at downstream side of bridge on State Highway 32, at south edge of Walhalla, and 7 mi downstream from Little South Pembina River.

DRAINAGE AREA.--3,350 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to September 1990 (discontinued). Prior to October 1963, published as "near Walhalla."

REVISED RECORDS.--WSP 1388: 1943, 1950(P). WSP 1558: 1957. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 934 ft above National Geodetic Vertical Datum of 1929 from topographic map. Prior to Nov. 10, 1943, nonrecording gage and Nov. 10, 1943, to Sept. 30, 1963, water-stage recorder at site 5.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 18 to Mar. 6, Mar. 28 to Apr. 5, Aug. 7-9, Aug. 15-19, and Aug. 22-27. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--51 years, 219 ft³/s, 158,700 acre-ft/yr; median of yearly mean discharges, 159 ft³/s, 115,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,400 ft³/s, Apr. 18, 1950, gage height, 19.2 ft former site and datum, 16.2 ft present site and datum, from rating curve extended above 7,000 ft³/s on basis of contracted-opening measurement of peak flow; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 1	1500	*[a]1,200	*7.64	June 19	1615	581	4.32
June 12	0915	849	4.97				

Minimum daily discharge, 0.15 ft³/s, Sept. 8.
a - About

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	2.6	2.4	e2.3	e1.5	e1.9	e1000	131	67	58	7.8	2.0
2	1.5	2.6	2.2	e2.4	e1.5	e1.8	e900	126	89	55	7.9	2.0
3	1.5	2.6	2.3	e2.4	e1.6	e1.7	e830	126	111	128	9.5	2.0
4	1.8	3.2	2.6	e2.5	e1.8	e1.6	e650	133	95	139	8.5	1.9
5	2.5	3.6	2.6	e2.6	e2.0	e1.6	e500	125	88	75	6.7	1.6
6	2.4	3.5	2.3	e2.8	e2.2	e1.6	454	115	80	59	5.2	1.2
7	2.6	3.4	2.0	e3.0	e2.4	1.3	434	109	75	70	e3.5	.62
8	2.6	3.1	2.0	e2.9	e2.6	1.3	431	102	83	57	e2.8	.15
9	3.0	2.9	2.1	e2.9	e2.6	1.9	417	93	88	46	e2.0	.22
10	3.3	2.8	1.8	e3.0	e2.5	1.8	358	86	86	39	5.6	.36
11	3.5	2.8	1.7	e2.9	e2.4	1.8	288	84	105	35	5.7	.49
12	3.3	2.9	1.5	e2.8	e2.5	3.0	246	81	470	31	5.6	.67
13	3.1	2.9	1.4	e2.8	e2.3	5.3	230	79	478	30	5.1	1.1
14	3.3	2.9	1.0	e2.7	e2.1	6.0	238	75	361	31	4.7	1.2
15	3.8	2.9	1.6	e2.6	e1.9	7.1	234	71	225	31	e4.0	1.2
16	3.8	2.6	1.7	e2.6	e1.7	5.1	242	78	174	29	e3.8	1.3
17	3.8	2.6	1.4	e2.5	e1.5	4.9	245	99	143	29	e3.4	1.3
18	4.3	2.4	e1.4	e2.5	e1.5	4.9	222	98	131	27	e3.0	1.5
19	3.9	3.0	e1.4	e2.4	e1.6	4.4	217	92	360	26	e2.4	1.4
20	2.4	3.3	e1.4	e2.4	e2.0	3.5	208	111	381	24	3.9	1.5
21	2.4	3.0	e1.4	e2.5	e2.0	2.9	203	128	266	23	4.1	1.5
22	2.6	2.8	e1.4	e2.6	e1.9	2.4	196	121	186	22	e3.5	1.5
23	2.7	2.8	e1.6	e2.7	e1.7	2.1	189	109	159	20	e2.0	1.6
24	2.7	2.7	e1.8	e2.5	e1.6	1.9	186	108	129	18	e.80	1.6
25	2.5	2.7	e2.0	e2.3	e1.5	1.9	181	102	105	16	e.50	1.6
26	2.6	2.6	e2.0	e2.1	e1.6	2.0	175	88	93	18	e.80	1.7
27	2.9	2.5	e2.1	e1.9	e1.7	2.9	165	86	84	14	e1.0	1.7
28	2.7	2.3	e2.1	e1.7	e2.0	e5.0	165	81	77	12	1.6	1.8
29	2.8	2.4	e2.2	e1.6	---	e20	153	76	73	11	1.6	1.8
30	2.8	2.4	e2.2	e1.5	---	e50	141	71	62	9.6	1.8	1.9
31	2.7	---	e2.3	e1.5	---	e500	---	68	---	8.5	1.9	---
TOTAL	87.5	84.8	57.9	75.9	54.2	653.6	10098	3052	4924	1191.1	120.70	40.41
MEAN	2.82	2.83	1.87	2.45	1.94	21.1	337	98.5	164	38.4	3.89	1.35
MAX	4.3	3.6	2.6	3.0	2.6	500	1000	133	478	139	9.5	2.0
MIN	1.5	2.3	1.0	1.5	1.5	1.3	141	68	62	8.5	.50	.15
AC-FT	174	168	115	151	108	1300	20030	6050	9770	2360	239	80

CAL YR 1989 TOTAL 9132.99 MEAN 25.0 MAX 700 MIN .05 AC-FT 18120
WTR YR 1990 TOTAL 20440.11 MEAN 56.0 MAX 1000 MIN .15 AC-FT 40540

e Estimated

05099600 PEMBINA RIVER AT WALHALLA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1962 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	1630	1.5	785	--	15.0	8.5	--	--	--	--	--	--
NOV												
28...	1205	2.3	840	--	-10.0	0.5	--	--	--	--	--	--
JAN												
08...	1710	2.9	800	--	-4.0	1.0	--	--	--	--	--	--
MAR												
06...	1220	1.6	830	--	-1.0	1.0	--	--	--	--	--	--
28...	0800	4.8	630	--	-2.0	1.5	--	--	--	--	--	--
APR												
03...	1420	828	600	--	10.0	0.5	--	--	--	--	--	--
06...	1425	484	400	--	4.0	2.5	--	--	--	--	--	--
09...	1620	443	475	8.0	8.0	7.5	150	37	13	24	25	0.9
MAY												
10...	0725	86	730	--	3.0	5.0	--	--	--	--	--	--
JUN												
14...	1630	310	555	--	16.0	18.5	--	--	--	--	--	--
JUL												
26...	1210	17	838	8.2	24.5	23.0	340	87	30	48	23	1
SEP												
06...	0935	1.1	745	--	22.5	22.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	7.6	150	0	120	86	8.9	0.20	18	270	267	0.37
JUL											
26...	8.2	320	0	259	190	16	0.30	24	572	560	0.78

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
09...	323	2	60	120	1	23	120	0.2	4	1	260
JUL											
26...	25.9	3	150	40	1	59	140	0.4	5	1	500

05100000 PEMBINA RIVER AT NECHE, ND
(International gaging station)

LOCATION.--Lat 48°59'20", long 97°33'05", in SE¼NW¼ sec.31, T.164 N., R.53 W., Pembina County, Hydrologic Unit 09020313, on right bank 0.3 mi east of State Highway 18, and at north edge of Neche.

DRAINAGE AREA.--3,410 mi², approximately.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--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.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 809.69 ft above National Geodetic Vertical Datum of 1929. Prior to May 24, 1932, nonrecording gage at Burlington Northern Railway bridge 1 mi 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.

REMARKS.--Estimated daily discharges: Nov. 21 to Dec. 1, Apr. 2, 3, June 26 to July 3, and Sept. 6-30. Records good except those for periods of estimated daily discharges, which are fair.

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

AVERAGE DISCHARGE.--82 years (1904-8, 1910-15, 1920-90), 187 ft³/s, 135,500 acre-ft/yr; median of yearly mean discharges, 142 ft³/s, 101,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft³/s, Apr. 20, 1950, gage height, 21.58 ft, backwater from ice; from rating curve extended above 5,300 ft³/s; maximum gage height, 23.64 ft, Apr. 20, 1979, backwater from ice; no flow at times each year 1932-41, 1953, 1960-62.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 3	----	*1,000	[ab]*10.50	No other peak greater than base discharge.			

No flow Oct. 1 to Nov. 6 and Dec. 2 to Mar. 24.
a - Backwater from ice
b - from flood mark

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.10	.00	.00	.00	6.6	160	69	e100	8.7	.49
2	.00	.00	.00	.00	.00	.00	e700	151	92	e100	22	.11
3	.00	.00	.00	.00	.00	.00	e900	148	103	e120	15	.83
4	.00	.00	.00	.00	.00	.00	676	148	134	e120	13	.76
5	.00	.00	.00	.00	.00	.00	729	151	136	e110	13	.13
6	.00	.00	.00	.00	.00	.00	612	154	109	e90	9.9	e.20
7	.00	.49	.00	.00	.00	.00	492	148	93	e130	12	e.18
8	.00	6.9	.00	.00	.00	.00	457	134	88	e120	12	e.18
9	.00	11	.00	.00	.00	.00	430	128	85	100	9.9	e.18
10	.00	10	.00	.00	.00	.00	425	118	89	90	7.7	e.18
11	.00	10	.00	.00	.00	.00	336	114	95	71	6.5	e.18
12	.00	9.7	.00	.00	.00	.00	269	109	96	61	7.3	e.18
13	.00	8.9	.00	.00	.00	.00	228	106	227	56	6.2	e.18
14	.00	9.9	.00	.00	.00	.00	188	102	431	52	4.8	e.18
15	.00	9.8	.00	.00	.00	.00	188	101	418	47	4.6	e.18
16	.00	7.4	.00	.00	.00	.00	186	92	299	48	5.0	e.18
17	.00	5.5	.00	.00	.00	.00	186	95	236	53	3.5	e.18
18	.00	3.6	.00	.00	.00	.00	200	106	199	45	2.7	e.20
19	.00	3.0	.00	.00	.00	.00	200	125	175	42	3.1	e.20
20	.00	3.9	.00	.00	.00	.00	198	125	226	40	4.4	e.20
21	.00	e3.8	.00	.00	.00	.00	188	125	415	35	3.1	e.15
22	.00	e3.6	.00	.00	.00	.00	192	144	331	29	2.7	e.12
23	.00	e3.4	.00	.00	.00	.00	202	170	256	28	2.3	e.10
24	.00	e3.2	.00	.00	.00	.00	192	168	212	25	1.7	e.08
25	.00	e3.0	.00	.00	.00	1.4	192	142	188	23	1.2	e.06
26	.00	e2.8	.00	.00	.00	4.4	192	107	e176	24	1.5	e.05
27	.00	e2.6	.00	.00	.00	3.3	179	99	e164	27	1.6	e.05
28	.00	e2.5	.00	.00	.00	3.2	185	91	e152	25	1.4	e.04
29	.00	e1.5	.00	.00	---	3.3	185	81	e140	21	1.2	e.04
30	.00	e1.0	.00	.00	---	4.0	169	78	e120	19	1.7	e.04
31	.00	---	.00	.00	---	5.9	---	71	---	9.6	1.4	---
TOTAL	0.00	127.49	0.10	0.00	0.00	25.50	9482.6	3791	5554	1860.6	191.1	5.83
MEAN	.000	4.25	.003	.000	.000	.82	316	122	185	60.0	6.16	.19
MAX	.00	11	.10	.00	.00	5.9	900	170	431	130	22	.83
MIN	.00	.00	.00	.00	.00	.00	6.6	71	69	9.6	1.2	.04
AC-FT	.00	253	.2	.00	.00	51	18810	7520	11020	3690	379	12

CAL YR 1989 TOTAL 10760.48 MEAN 29.5 MAX 630 MIN .00 AC-FT 21340
WTR YR 1990 TOTAL 21038.22 MEAN 57.6 MAX 900 MIN .00 AC-FT 41730

e Estimated

05100000 PEMBINA RIVER AT NECHE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
28...	1045	2.5	--	--	-12.5	0.5	--	--	--	--	--	--
APR												
09...	1345	474	345	7.9	7.5	7.0	130	33	11	20	24	0.8
25...	1715	188	505	--	10.0	10.0	--	--	--	--	--	--
MAY												
10...	1035	116	825	--	8.5	8.0	--	--	--	--	--	--
JUN												
15...	1250	406	545	--	14.0	18.5	--	--	--	--	--	--
JUL												
26...	1555	27	888	8.2	26.0	23.0	360	91	32	48	22	1
SEP												
05...	1315	0.20	925	--	25.5	20.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	6.1	150	0	125	64	6.0	0.20	18	215	234	0.29
JUL											
26...	9.1	360	0	291	190	22	0.30	29	619	597	0.84

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
09...	275	<1	50	200	3	20	160	0.2	3	<1	240
JUL											
26...	45.8	5	160	40	<1	65	390	0.2	9	1	550

05101000 TONGUE RIVER AT AKRA, ND

LOCATION.--Lat 48°46'42", long 97°44'43", in SW¼ sec.10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, on left bank 300 ft downstream from Renwick Dam, 0.9 mi northwest of Akra, and 6 mi west of Cavalier.

DRAINAGE AREA.--160 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1950 (WSP 1137-B), October 1951 to current year (seasonal record since 1983).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 930.00 ft above National Geodetic Vertical Datum of 1929. Prior to July 10, 1954, nonrecording gage 1.2 mi downstream at datum 30.00 ft lower. July 23, 1954, to Dec. 19, 1973, water stage recorder 2.7 mi downstream at datum 9.10 ft lower.

REMARKS.--Estimated daily discharges: Mar. 1 to Sept. 30. Records poor. Flow regulated by temporary retention in ten retarding basins beginning 300 ft above station, four of which have slow release outlet structures to regulate the flow. Retarding basins were completed during the period 1955 to 1961 and have a combined capacity of 19,245 acre-ft.

AVERAGE DISCHARGE.--31 years (water years 1952-82), 21.4 ft³/s, 15,500 acre-ft/yr; median of yearly mean discharges, 19 ft³/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft³/s, Apr. 18, 1950, gage height, 48.7 ft, from floodmarks, site and datum then in use, from rating curve extended above 1,500 ft³/s on basis of contracted-opening measurement of peak flow; no flow at times. This flood is the highest known since settlement of the region in about 1860.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15 ft³/s, Apr. 24, gage height, 8.82 ft; maximum gage height, 9.18 ft, Aug. 29, backwater from beaver dam; minimum recorded daily discharge, 0.28 ft³/s, Apr. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e1.6	e.58	e7.4	e5.8	e3.1	e1.0	e2.1
2	---	---	---	---	---	e1.6	e.35	e7.1	e10	e3.2	e1.1	e2.0
3	---	---	---	---	---	e1.6	e.30	e9.2	e12	e3.2	e1.0	e1.6
4	---	---	---	---	---	e1.6	e.28	e11	e12	e2.6	e1.0	e1.2
5	---	---	---	---	---	e1.6	e.33	e11	e12	e2.5	e1.1	e1.1
6	---	---	---	---	---	e1.6	e.65	e10	e9.8	e2.5	e1.1	e1.4
7	---	---	---	---	---	e1.6	e.54	e9.2	e7.3	e2.6	e1.0	e1.2
8	---	---	---	---	---	e1.6	e.56	e8.4	e7.9	e2.6	e1.0	e1.2
9	---	---	---	---	---	e2.3	e.84	e6.8	e6.5	e2.1	e1.2	e1.1
10	---	---	---	---	---	e2.6	e.93	e6.1	e5.5	e1.7	e2.0	e1.2
11	---	---	---	---	---	e1.6	e1.2	e4.7	e4.9	e1.7	e2.0	e1.2
12	---	---	---	---	---	e1.4	e2.4	e3.9	e4.3	e1.6	e1.9	e1.2
13	---	---	---	---	---	e1.7	e5.1	e3.7	e3.9	e1.6	e1.9	e1.2
14	---	---	---	---	---	e1.7	e6.8	e5.1	e3.2	e2.4	e1.7	e1.2
15	---	---	---	---	---	e1.5	e7.2	e5.0	e3.3	e2.6	e1.7	e1.2
16	---	---	---	---	---	e1.5	e8.3	e6.1	e4.2	e2.7	e1.2	e1.2
17	---	---	---	---	---	e1.8	e8.0	e7.1	e4.2	e2.1	e1.1	e1.3
18	---	---	---	---	---	e2.2	e8.1	e6.5	e3.8	e1.6	e1.2	e1.3
19	---	---	---	---	---	e1.9	e8.7	e7.3	e4.6	e1.8	e1.1	e1.3
20	---	---	---	---	---	e1.7	e9.5	e7.6	e5.6	e2.2	e1.1	e1.3
21	---	---	---	---	---	e1.6	e11	e7.0	e6.1	e1.6	e1.2	e1.3
22	---	---	---	---	---	e1.5	e13	e7.1	e5.5	e1.3	e1.1	e1.3
23	---	---	---	---	---	e1.4	e14	e7.2	e5.7	e1.6	e1.1	e1.3
24	---	---	---	---	---	e1.2	e14	e6.4	e5.4	e1.4	e1.1	e1.4
25	---	---	---	---	---	e1.1	e14	e5.5	e5.4	e1.2	e1.1	e1.4
26	---	---	---	---	---	e1.4	e12	e5.3	e6.0	e1.1	e1.1	e1.4
27	---	---	---	---	---	e1.3	e9.9	e5.8	e6.0	e1.0	e1.1	e1.7
28	---	---	---	---	---	e1.1	e11	e5.9	e4.5	e1.1	e2.0	e2.8
29	---	---	---	---	---	e1.5	e9.9	e5.7	e4.4	e1.1	e2.8	e1.9
30	---	---	---	---	---	e.62	e8.5	e5.1	e3.7	e1.4	e3.0	e1.4
31	---	---	---	---	---	e.60	---	e5.4	---	e1.3	e2.3	---
TOTAL	---	---	---	---	---	48.02	187.96	209.6	183.5	60.5	44.3	42.4
MEAN	---	---	---	---	---	1.55	6.27	6.76	6.12	1.95	1.43	1.41
MAX	---	---	---	---	---	2.6	14	11	12	3.2	3.0	2.8
MIN	---	---	---	---	---	.60	.28	3.7	3.2	1.0	1.0	1.1
AC-FT	---	---	---	---	---	95	373	416	364	120	88	84

e Estimated

05101000 TONGUE RIVER AT AKRA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
FEB												
27...	1210	1.6	925	--	-7.0	3.5	--	--	--	--	--	--
MAR												
13...	1325	1.6	845	--	7.0	6.0	--	--	--	--	--	--
APR												
04...	1600	0.23	828	7.9	-3.5	2.5	350	92	30	37	18	0.9
MAY												
24...	1425	5.9	540	--	24.0	16.0	--	--	--	--	--	--
JUN												
15...	1000	3.4	545	--	13.0	19.0	--	--	--	--	--	--
JUL												
26...	0845	1.0	570	8.0	21.0	21.0	240	60	21	25	18	0.7
SEP												
05...	1635	1.1	580	--	26.5	21.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	7.6	360	0	300	130	14	0.40	14	482	505	0.66
JUL											
26...	4.9	260	0	210	74	12	0.20	12	355	336	0.48

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
04...	0.30	3	100	30	2	45	2100	0.1	4	<1	440
JUL											
26...	0.96	8	80	40	<1	30	950	0.2	2	<1	320

05102500 RED RIVER OF THE NORTH AT EMERSON, MAN
(National stream-quality accounting network station)
(International gaging station)

LOCATION.--Lat 49°00'30", long 97°12'40", in sec.2, T.1, R.2 E., Hydrologic Unit 09020311, on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, 0.8 mi downstream from international boundary, 3.6 mi downstream from Pembina River, and at mile 154.3.

DRAINAGE AREA.--40,200 mi^2, approximately, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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 Geodetic Survey of Canada Datum of 1929. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

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

AVERAGE DISCHARGE.--78 years (water years 1913-90), 3,350 ft^3/s, 2,427,000 acre-ft/yr; median of yearly mean discharges, 2,870 ft^3/s, 2,080,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 95,500 ft^3/s, May 13, 1950, gage height, 90.89 ft; maximum gage height, 91.19 ft, May 1, 1979; minimum observed discharge, 0.9 ft^3/s, Feb. 6-8, 1937.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,510 ft^3/s, Apr. 10, gage height, 760.90 ft; minimum daily, 138 ft^3/s, Jan. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	417	367	e353	e144	e232	e262	e3460	1640	1440	2160	727	374
2	424	357	e348	e138	e236	e264	e3920	1650	1470	2030	724	374
3	445	350	e341	e152	e243	e267	e4060	1670	1480	1960	671	395
4	505	395	e344	e159	e254	e271	e4520	1710	1490	1840	618	427
5	526	438	e343	e157	e265	e276	e4550	1800	1600	1740	565	424
6	523	392	e338	e156	e272	e282	e4730	1850	1960	1680	523	431
7	501	364	e332	e153	e276	e288	e4980	1890	2460	1630	487	434
8	487	350	e326	e148	e279	e294	e5230	1900	2840	1540	452	420
9	463	340	e320	e150	e279	e306	e5370	1890	2950	1510	438	417
10	431	371	e308	e152	e278	e322	e5470	1870	2880	1500	420	403
11	424	410	e293	e160	e276	e328	e5330	1830	2700	1450	410	395
12	438	371	e282	e164	e273	e360	e5190	1780	2500	1360	410	392
13	448	388	e276	e169	e270	e438	e5160	1750	2320	1260	413	367
14	463	395	e270	e170	e266	e455	e4980	1700	2200	1150	413	352
15	470	388	e263	e166	e255	e519	e4630	1660	2250	1070	388	346
16	459	378	e256	e164	e244	e674	e4310	1620	2230	1010	364	347
17	456	388	e252	e167	e240	e734	e3710	1550	2190	978	378	340
18	463	392	e246	e171	e250	e996	e3250	1520	2140	953	371	352
19	452	371	e236	e169	e261	e1330	2850	1500	2090	943	388	328
20	431	381	e223	e167	e265	e1790	2420	1480	2010	936	445	293
21	420	385	e204	e167	e264	e2310	2190	1490	1960	879	470	284
22	456	e374	e192	e168	e263	e2680	2020	1510	2010	830	463	280
23	484	e364	e193	e174	e266	e2730	1900	1560	1980	773	455	282
24	480	e360	e202	e183	e266	e2580	1800	1610	1970	731	452	317
25	470	e364	e202	e191	e262	e2380	1730	1630	2110	703	445	353
26	448	e364	e193	e199	e260	e2160	1660	1630	2350	689	452	374
27	424	e364	e187	e207	e258	e2010	1610	1620	2500	692	452	395
28	431	e367	e177	e212	e258	e1900	1620	1600	2520	710	431	388
29	399	e367	e171	e219	---	e1860	1640	1570	2430	731	406	360
30	378	e357	e167	e223	---	e2000	1650	1530	2300	745	392	329
31	374	---	e160	e228	---	e2500	---	1480	---	749	385	---
TOTAL	13990	11252	7998	5347	7311	35566	105940	51490	65330	36932	14408	10973
MEAN	451	375	258	172	261	1147	3531	1661	2178	1191	465	366
MAX	526	438	353	228	279	2730	5470	1900	2950	2160	727	434
MIN	374	340	160	138	232	262	1610	1480	1440	689	364	280
AC-FT	27750	22320	15860	10610	14500	70550	210100	102100	129600	73250	28580	21760

CAL YR 1989 TOTAL 1082833 MEAN 2967 MAX 42400 MIN 160 AC-FT 2148000
WTR YR 1990 TOTAL 366537 MEAN 1004 MAX 5470 MIN 138 AC-FT 727000

e Estimated

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1977 to current year.
WATER TEMPERATURE: October 1977 to current year.

REMARKS.--Records of daily mean values of water temperature and specific conductance are furnished by Water Survey of Canada.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 2,180 microsiemens, Dec. 8, 1989; minimum daily mean, 259 microsiemens, Apr. 14, 1989.

WATER TEMPERATURES: Maximum daily mean, 26.7 °C, Aug. 16, 1988; minimum daily mean, 0.0 °C, on many days during winter months.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 1,460 microsiemens, Dec. 3, 26-28; minimum daily mean, 432 microsiemens, Apr. 3.

WATER TEMPERATURES: Maximum daily mean, 24.9 °C, July 3; minimum daily mean, 0.0 °C, on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
06...	1200	--	760	8.5	4.5	7.5	32	10.2	85	K75	130
NOV											
07...	1150	--	920	8.6	4.0	2.5	11	9.4	70	K7	K23
APR											
17...	1000	3730	705	8.0	2.5	3.0	87	15.5	113	K4	710
MAY											
31...	1000	--	830	8.6	22.0	21.0	84	8.3	92	K12	K15
JUL											
17...	1150	--	882	8.5	23.0	25.5	59	6.6	82	K10	K20

DATE	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
OCT											
06...	260	58	29	52	29	1	7.8	189	191	227	0
NOV											
07...	330	68	40	68	30	2	10	226	271	326	2
APR											
17...	200	47	21	44	31	1	7.2	144	152	185	0
MAY											
31...	300	66	33	49	26	1	6.9	236	177	182	17
JUL											
17...	310	69	34	64	30	2	9.8	238	223	252	10

DATE	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
OCT										
06...	100	59	0.20	15	438	436	0.60	--	--	<0.010
NOV										
07...	140	90	0.30	2.9	576	582	0.78	--	--	<0.010
APR										
17...	76	62	0.20	12	393	365	0.53	3960	0.880	0.020
MAY										
31...	100	57	0.20	2.5	466	423	0.63	--	0.180	0.020
JUL										
17...	100	86	0.20	16	542	515	0.74	--	--	<0.010

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT 06...	0.560	0.030	0.040	0.80	0.200	0.140	0.150	<10	5	57
NOV 07...	<0.100	0.030	0.010	1.1	0.190	0.130	0.140	--	--	--
APR 17...	0.900	0.280	0.220	1.0	0.240	0.100	0.100	70	2	40
MAY 31...	0.200	0.030	0.110	<0.20	0.180	0.050	0.050	30	<1	63
JUL 17...	0.300	0.050	0.030	1.1	0.220	0.140	0.140	<10	6	74

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT 06...	<0.5	<1.0	1	<3	5	13	<1	36	11	<0.1
APR 17...	<0.5	<1.0	2	<3	10	100	11	28	31	0.1
MAY 31...	0.9	<1.0	2	<3	4	17	2	37	5	<0.1
JUL 17...	<0.5	<1.0	1	<3	9	10	1	44	2	<0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 06...	20	4	<1	<1.0	260	6	16	90	--	92
NOV 07...	--	--	--	--	--	--	--	26	--	97
APR 17...	<10	5	<1	<1.0	230	<6	12	212	2140	100
MAY 31...	<10	3	<1	<1.0	300	<6	11	242	--	98
JUL 17...	<10	5	<1	<1.0	330	8	5	142	--	99

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	795	800	1400	1170	1120	911	512	830	797	748	961	883
2	793	779	1440	1060	1130	907	443	833	803	751	940	871
3	790	764	1460	1040	1150	897	432	835	809	756	903	867
4	792	778	1410	1030	1160	901	434	835	778	804	883	810
5	790	771	1280	1180	1180	907	498	832	776	803	871	883
6	787	780	1210	1170	1180	887	568	849	752	811	854	944
7	780	912	1260	1150	1160	869	601	862	738	804	811	981
8	776	1040	1360	1140	1120	881	643	844	716	795	804	990
9	771	1050	1360	1130	1110	880	622	832	689	791	803	1020
10	763	1010	1340	1120	1100	877	598	841	658	806	800	1030
11	740	951	1340	1110	1060	864	538	840	635	810	803	1070
12	777	894	1340	1080	1050	863	572	832	630	827	805	1070
13	783	870	1330	1050	1040	813	566	832	650	823	806	1060
14	783	876	1300	1050	1030	726	559	864	654	874	809	978
15	782	919	1300	1040	1020	831	567	900	655	929	819	923
16	794	993	1360	1040	1010	844	608	889	653	916	818	901
17	815	1080	1410	1040	1000	528	662	882	655	915	790	906
18	828	1160	1420	1050	1010	788	685	884	658	909	802	911
19	815	1130	1400	1030	1010	860	680	872	662	945	809	918
20	809	1130	1400	1020	1010	808	691	853	670	955	806	928
21	815	1100	1400	1010	1010	861	702	862	675	917	785	939
22	841	1000	1400	1000	1010	829	710	966	684	906	781	949
23	892	1090	1410	1000	992	789	718	952	704	946	785	964
24	838	1160	1240	1010	971	759	752	950	719	972	798	971
25	796	1260	1300	1030	980	721	758	947	723	964	796	985
26	803	1350	1460	1040	970	686	754	943	762	960	797	986
27	819	1330	1460	1050	972	701	782	943	787	961	805	985
28	867	1370	1460	1050	950	673	788	937	772	960	812	985
29	920	1340	1440	1050	---	633	779	805	760	962	789	989
30	914	1360	1340	1060	---	617	809	801	749	965	795	990
31	871	---	1210	1090	---	573	---	798	---	969	829	---
MEAN	811	1030	1360	1070	1050	796	634	869	712	879	822	956

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	5.1	1.3	.0	.1	.2	1.3	8.4	16.5	24.3	23.4	21.8
2	12.3	3.7	1.2	.0	.0	.2	1.2	8.6	16.7	24.6	23.4	21.3
3	9.9	2.9	1.3	.1	.0	.2	1.1	9.4	16.9	24.9	23.4	21.5
4	9.9	2.8	1.3	.0	.0	.1	1.1	9.7	17.3	24.5	23.3	21.7
5	9.7	2.8	1.2	.0	.0	.0	1.0	10.9	18.0	23.1	23.4	21.3
6	9.5	2.8	1.2	.0	.0	.2	.8	12.2	18.1	22.1	23.4	21.7
7	9.1	2.6	1.1	.0	.0	.4	.8	13.5	18.3	21.3	23.6	21.4
8	8.6	2.4	.8	.0	.0	.4	.8	13.7	18.5	21.5	23.8	21.0
9	8.4	2.2	.6	.1	.1	.6	.9	12.1	18.9	22.3	23.5	20.1
10	8.7	2.4	.5	.0	.0	.9	.9	11.8	19.2	22.7	22.9	19.3
11	9.5	2.6	.5	.0	.1	1.0	.8	12.0	19.7	22.7	22.2	19.0
12	9.7	2.7	.5	.1	.1	1.3	.8	12.3	20.1	22.6	21.8	18.7
13	9.8	2.7	.4	.0	.1	1.8	.9	12.5	20.4	22.9	21.2	18.5
14	9.5	2.7	.3	.0	.0	2.0	1.0	13.0	20.5	23.0	20.9	17.4
15	9.4	2.6	.1	.0	.0	1.9	1.4	13.4	20.6	23.4	20.4	17.1
16	8.5	2.5	.0	.0	.1	1.7	1.7	13.2	20.9	23.3	20.9	16.0
17	8.1	2.6	.1	.0	.5	1.6	2.4	12.1	21.2	23.4	21.1	15.6
18	7.2	2.6	.0	.0	.9	1.7	3.9	11.2	21.2	23.0	20.2	15.3
19	6.6	2.2	.0	.1	.8	1.7	5.0	11.9	21.5	22.3	19.7	15.0
20	6.6	2.3	.0	.0	.9	1.7	5.9	12.9	21.9	22.3	19.8	14.7
21	6.9	2.3	.1	.0	.7	1.7	6.9	12.9	22.3	22.2	21.2	14.3
22	7.5	2.4	.0	.0	.8	1.6	7.9	12.5	22.8	22.0	21.4	13.9
23	7.7	1.8	.0	.0	.8	1.6	9.0	12.4	23.2	22.4	22.6	13.6
24	8.1	1.3	.0	.1	.8	1.7	10.0	12.6	23.4	22.3	23.1	13.2
25	8.7	1.4	.0	.1	.8	1.6	10.0	12.8	23.5	22.3	23.2	12.7
26	9.9	1.4	.0	.0	.6	1.5	10.5	12.9	22.9	22.9	23.0	12.2
27	11.0	1.3	.0	.1	.7	1.1	9.4	14.2	23.4	23.3	23.2	11.5
28	10.2	1.3	.0	.0	.3	1.2	7.9	14.4	23.5	23.6	22.2	11.2
29	9.1	1.4	.0	.0	---	1.3	7.3	15.3	24.6	23.6	21.4	10.9
30	7.7	1.4	.1	.1	---	1.4	7.9	16.2	24.5	23.4	21.5	10.7
31	6.8	---	.0	.0	---	1.3	---	16.6	---	23.3	22.3	---
MEAN	9.1	2.4	.4	.0	.3	1.1	4.0	12.5	20.7	23.0	22.2	16.8

05113360 LONG CREEK AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY, SASK
(International gaging station)

LOCATION.--Lat 49°00'01", long 103°21'08", in SE$^1/_4$ sec.1, T.1, R.11 W., 2d meridian, Hydrologic Unit 09010001, and on right bank 10 mi south of Outram, Saskatchewan.

DRAINAGE AREA.--1,320 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,894.00 ft above National Geodetic Vertical Datum of 1929, international boundary survey.

REMARKS.--Records good.

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

AVERAGE DISCHARGE.--31 years, 33.8 ft^3/s, 24,490 acre-ft/yr; median of yearly mean discharges, 16 ft^3/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,690 ft^3/s, Apr. 1, 1976, gage height, 12.05 ft; maximum gage height, 12.70 ft, Mar. 31, 1976 backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 833 ft^3/s, July 3, gage height, 6.28 ft; no flow much of the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.60	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.71	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	371	.56	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	456	.35	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	200	.25	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	211	.18	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	122	.11	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	64	.07	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	42	.04	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	31	.04	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	21	.04	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	14	.04	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	9.1	.00	.00
14	.00	.00	.00	.00	.00	.00	.11	.00	.00	6.2	.00	.00
15	.00	.00	.00	.00	.00	.00	.81	.00	.00	3.8	.00	.00
16	.00	.00	.00	.00	.00	.00	.78	.00	.00	2.6	.00	.00
17	.00	.00	.00	.00	.00	.00	.39	.00	.00	1.8	.00	.00
18	.00	.00	.00	.00	.00	.00	.25	.00	.00	1.3	.00	.00
19	.00	.00	.00	.00	.00	.00	.18	.00	.00	2.1	.00	.00
20	.00	.00	.00	.00	.00	.00	.11	.00	.00	2.8	.00	.00
21	.00	.00	.00	.00	.00	.00	.11	.00	.00	1.6	.00	.00
22	.00	.00	.00	.00	.00	.00	.07	.00	.00	1.0	.00	.00
23	.00	.00	.00	.00	.00	.00	.07	.00	.00	.85	.00	.00
24	.00	.00	.00	.00	.00	.00	.04	.00	.00	.56	.00	.00
25	.00	.00	.00	.00	.00	.00	.07	.00	.00	.18	.00	.00
26	.00	.00	.00	.00	.00	.00	.07	.00	.00	.04	.00	.00
27	.00	.00	.00	.00	.00	.00	.04	.00	.00	.04	.00	.00
28	.00	.00	.00	.00	.00	.00	.04	.00	.00	.04	.00	.00
29	.00	.00	.00	.00	---	.00	.04	.00	.00	.04	.00	.00
30	.00	.00	.00	.00	---	.00	.04	.00	.00	.04	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.04	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	3.22	0.00	0.00	1566.13	2.99	0.00
MEAN	.000	.000	.000	.000	.000	.000	.11	.000	.000	50.5	.096	.000
MAX	.00	.00	.00	.00	.00	.00	.81	.00	.00	456	.71	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	6.4	.00	.00	3110	5.9	.00

CAL YR 1989 TOTAL 5688.15 MEAN 15.6 MAX 1030 MIN .00 AC-FT 11280
WTR YR 1990 TOTAL 1572.34 MEAN 4.31 MAX 456 MIN .00 AC-FT 3120

05113600 LONG CREEK NEAR NOONAN, ND
(International gaging station)

LOCATION.--Lat 48°58'52", long 103°04'34", near north line of NE$^1/_4$ sec.1, T.163 N., R.96 W., Divide County, Hydrologic Unit 09010001, on right bank 150 ft upstream from county highway bridge, 1.5 mi upstream from international boundary, and 7 mi northwest of Noonan.

DRAINAGE AREA.--1,790 mi^2, approximately, of which about 1,160 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,840 ft, from topographic map. Prior to Aug. 18, 1960, non-recording gage at same site and datum.

REMARKS.--Records good.

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

AVERAGE DISCHARGE.--31 years, 43.9 ft^3/s, 31,810 acre-ft/yr; median of yearly mean discharges, 21 ft^3/s, 15,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,310 ft^3/s, Mar. 31, 1976, gage height, 17.61 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
July 4	1445	*785	*8.79	No other peak greater than base discharge.			

No flow much of the time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.11	.01	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.14	.47	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.09	505	.01	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.07	412	.03	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.05	256	.04	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.06	223	.02	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.08	146	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.07	88	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.06	56	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.07	44	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.06	31	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.04	24	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.03	18	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.02	13	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.02	8.8	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.06	5.7	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.07	4.2	.01	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.05	3.1	.04	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.04	1.9	.06	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.02	1.0	.04	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.01	.44	.02	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.01	.39	.01	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.27	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.15	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.32	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.06	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.02	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	1843.17	0.28	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.041	59.5	.009	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.14	505	.06	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	2.4	3660	.6	.00

CAL YR 1989 TOTAL 7563.46 MEAN 20.7 MAX 1070 MIN .00 AC-FT 15000
WTR YR 1990 TOTAL 1844.68 MEAN 5.05 MAX 505 MIN .00 AC-FT 3660

05113600 LONG CREEK NEAR NOONAN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
JUN												
05...	1005	0.07	3580	9.5	13.5	14.0	430	45	76	130	39	3
JUL												
10...	1045	58	640	7.5	24.0	22.0	190	38	22	54	37	2
AUG												
07...	1030	0.03	990	--	33.5	25.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
JUN											
05...	13	210	33	227	490	26	0.20	4.5	919	921	1.25
JUL											
10...	10	170	0	143	170	10	0.10	18	425	408	0.58

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
JUN											
05...	0.17	4	80	20	<1	76	20	<0.1	<1	1	340
JUL											
10...	66.2	4	70	140	<1	28	150	0.1	1	<1	250

05113750 EAST BRANCH SHORT CREEK RESERVOIR NEAR COLUMBUS, ND

LOCATION.--Lat 48°59'26", long 102°47'07", in $SW^1/_4NW^1/_4$ sec.32, T.164 N., R.93 W., Burke County, Hydrologic Unit 09010001, on left bank of reservoir on East Branch Short Creek, 0.5 mi south of international boundary, and 6.0 mi north of Columbus.

DRAINAGE AREA.--280 mi^2, of which 175 mi^2 is probably noncontributing.

RESERVOIR-GAGE HEIGHT AND CONTENTS RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. 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 National Geodetic Vertical Datum of 1929. Reservoir capacity at crest elevation, 1,200 acre-ft. The reservoir is operated for water supply and recreation. Records of daily reservoir stage and contents are available from files at the Bismarck District office.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,850 acre-ft, Mar. 28, 1976, gage height, 32.13 ft; minimum, 770 acre-ft, Dec. 10, 1988, gage height, 22.57 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,100 acre-ft, July 7, gage height, 26.05 ft; minimum contents, 1,000 acre-ft, Sept. 30, gage height, 25.05 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	25.67	1,060	--
Oct. 31	25.51	1,040	-20
Nov. 30	25.41	1,030	-10
Dec. 31	--	*1,030	0
CAL YR 1989	--	--	+250
Jan. 31	--	*1,040	+10
Feb. 28	25.52	1,040	0
Mar. 31	25.76	1,070	+30
Apr. 30	25.48	1,040	-30
May 31	25.46	1,040	0
June 30	25.38	1,030	-10
July 31	25.72	1,060	+30
Aug. 31	25.36	1,030	-30
Sept. 30	25.05	1,000	-30
WTR YR 1990	--	--	-60

* - Estimated

05113800 SHORT CREEK BELOW INTERNATIONAL BOUNDARY NEAR ROCHE PERCEE, SASK
(International gaging station)

LOCATION.--Lat 49°01'42", long 102°51'00", in SW¼ sec.14, T.1, R.7 W., 2d meridian, Hydrologic Unit 09010001, 4 mi southwest of Roche Percee, Saskatchewan, and 5 mi upstream from mouth.

DRAINAGE AREA.--480 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder.

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

AVERAGE DISCHARGE.--30 years, 11.4 ft³/s, 8,260 acre-ft/yr; median of yearly mean discharges, 4.8 ft³/s, 3,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft³/s, Apr. 7, 1969, gage height, 14.33 ft; maximum gage height, 14.39 ft, Mar. 28, 1960; no flow on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9.9 ft³/s, July 11, gage height, 3.81 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	e.00	e.14	.04	.00	.04	6.8	.14
2	.00	.00	.00	.00	.00	e.00	.11	.00	.39	.81	6.5	.14
3	.00	.00	.00	.00	.00	e.00	.07	.00	.21	.92	4.6	.11
4	.00	.00	.00	.00	.00	e.00	.07	.00	.11	.11	2.8	.11
5	.00	.00	.00	.00	.00	e.00	.07	.00	.07	.04	2.1	.07
6	.00	.00	.00	.00	.00	e.00	.07	.00	.07	.00	1.6	.04
7	.00	.00	.00	.00	.00	e.00	.04	.00	.04	.04	1.2	.04
8	.00	.00	.00	.00	.00	e.00	.04	.00	.04	5.4	.85	.00
9	.00	.00	.00	.00	.00	e.00	.00	.00	.04	6.7	.56	.00
10	.00	.00	.00	.00	.00	e.00	.00	.00	.00	7.3	.39	.00
11	.00	.00	.00	.00	.00	e.07	.00	.00	.00	7.9	.39	.00
12	.00	.00	.00	.00	.00	e.32	.00	.00	.00	6.6	.32	.00
13	.00	.00	.00	.00	.00	e.21	.00	.00	.00	4.6	.35	.00
14	.00	.00	.00	.00	.00	e.14	.00	.00	.00	2.8	.25	.00
15	.00	.00	.00	.00	.00	e.11	.00	.00	.00	1.9	.25	.00
16	.00	.00	.00	.00	.00	e.11	.00	.04	.00	1.4	.21	.00
17	.00	.00	.00	.00	.00	e.11	.00	.04	.00	1.1	.21	.00
18	.00	.00	.00	.00	.00	e.11	.00	.04	.00	.81	.81	.00
19	.00	.00	.00	.00	.00	e.11	.00	.00	.00	.71	.53	.00
20	.00	.00	.00	.00	.00	e.14	.00	.00	.00	.49	.53	.00
21	.00	.00	.00	.00	.00	e.11	.00	.00	.00	.39	.46	.00
22	.00	.00	.00	.00	.00	e.07	.00	.00	.00	.28	.39	.00
23	.00	.00	.00	.00	.00	e.04	.00	.04	.00	.25	.39	.00
24	.00	.00	.00	.00	.00	e.04	.04	.04	.00	.21	.35	.00
25	.00	.00	.00	.00	.00	e.04	.07	.00	.00	.14	.39	.00
26	.00	.00	.00	.00	.00	e.04	.11	.04	.00	.71	.35	.00
27	.00	.00	.00	.00	.00	e.04	.11	.04	.00	1.5	.35	.00
28	.00	.00	.00	.00	.00	e.07	.07	.00	.00	.95	.32	.00
29	.00	.00	.00	.00	---	e.07	.07	.00	.00	.49	.25	.00
30	.00	.00	.00	.00	---	e.14	.07	.00	.00	.39	.21	.00
31	.00	---	.00	.00	---	e.14	---	.00	---	1.2	.18	---
TOTAL	0.00	0.00	0.00	0.00	0.00	2.23	1.15	0.32	0.97	56.18	34.89	0.65
MEAN	.000	.000	.000	.000	.000	.072	.038	.010	.032	1.81	1.13	.022
MAX	.00	.00	.00	.00	.00	.32	.14	.04	.39	7.9	6.8	.14
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.18	.00
AC-FT	.00	.00	.00	.00	.00	4.4	2.3	.6	1.9	111	69	1.3

CAL YR 1989 TOTAL 2009.76 MEAN 5.51 MAX 225 MIN .00 AC-FT 3990
WTR YR 1990 TOTAL 96.39 MEAN .26 MAX 7.9 MIN .00 AC-FT 191

e Estimated

05114000 SOURIS (MOUSE) RIVER NEAR SHERWOOD, ND
(International gaging station)

LOCATION.--Lat 48°59'24", long 101°57'28", in NW¼SE¼NE¼ sec.33, T.164 N., R.87 W., Renville County, Hydrologic Unit 09010001, on right bank 0.8 mi downstream from international boundary, 16 mi northwest of Sherwood, and at mile 511.4.

DRAINAGE AREA.--8,940 mi², approximately, of which about 5,900 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1308: 1934, 1945. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,603.73 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 8, 1935, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 7 to Apr. 6, ice effect, June 7-21 and Aug. 24 to Sept. 4, beaver activity. Records good except periods of estimated discharge, which are fair. Some regulation 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.

AVERAGE DISCHARGE.--60 years, 130 ft³/s, 94,180 acre-ft/yr; median of yearly mean discharges, 64 ft³/s, 46,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft³/s, Apr. 10, 1976, gage height, 25.15 ft; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1927 reached a stage of about 22 ft and flood in 1904 reached a stage of about 25.8 ft from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 253 ft³/s, Apr. 3, gage height, 5.74 ft, backwater from ice; no flow, Oct. 1-11, Dec. 22 to Jan. 23, Jan. 30 to Feb. 7, Feb. 10-23, Feb. 27 to Mar. 2, and Sept. 5-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	4.5	2.3	e.00	e.00	e.00	e38	12	1.7	.64	4.4	e.15
2	.00	5.7	2.2	e.00	e.00	e.00	e70	11	2.5	.62	4.2	e.10
3	.00	5.9	2.1	e.00	e.00	e.02	e240	11	2.7	.81	4.4	e.05
4	.00	5.9	2.3	e.00	e.00	e.02	e150	10	2.4	.75	4.0	e.02
5	.00	5.3	2.5	e.00	e.00	e.04	e110	10	1.9	.54	3.6	.00
6	.00	4.9	2.3	e.00	e.00	e.04	e100	9.6	1.7	.46	3.1	.00
7	.00	4.4	e1.9	e.00	e.00	e.10	78	9.3	e1.4	.65	2.5	.00
8	.00	4.2	e1.8	e.00	e.03	e.40	45	9.1	e1.3	.60	2.3	.00
9	.00	4.4	e1.7	e.00	e.02	e.60	36	8.2	e1.1	.41	1.9	.00
10	.00	4.0	e1.6	e.00	e.00	e.80	29	7.0	e1.0	.42	1.6	.00
11	.00	3.5	e1.5	e.00	e.00	e.90	24	6.5	e1.1	60	1.6	.00
12	15	3.1	e1.3	e.00	e.00	e1.2	21	6.9	e.90	104	1.8	.00
13	204	2.8	e1.1	e.00	e.00	e1.3	18	7.5	e.70	90	1.4	.00
14	188	3.2	e.80	e.00	e.00	e.60	16	7.6	e.60	78	.92	.00
15	152	2.9	e.40	e.00	e.00	e.70	14	7.9	e.40	64	.61	.00
16	127	3.1	e.35	e.00	e.00	e2.0	27	8.1	e.30	39	.40	.00
17	95	2.9	e.30	e.00	e.00	e1.5	27	8.4	e.70	25	.36	.00
18	67	2.7	e.25	e.00	e.00	e80	23	8.2	e.70	17	.62	.00
19	52	2.7	e.20	e.00	e.00	e200	22	7.9	e.50	13	.74	.00
20	39	2.8	e.10	e.00	e.00	e150	21	7.5	e.30	12	.48	.00
21	29	2.9	e.05	e.00	e.00	e100	18	7.4	e.50	10	.39	.00
22	24	2.9	e.00	e.00	e.00	e30	17	7.3	.74	8.2	.39	.00
23	20	2.6	e.00	e.00	e.00	e20	16	6.7	.62	6.6	.48	.00
24	16	2.6	e.00	e.03	e.02	e15	15	6.0	.50	6.4	e.44	.00
25	14	2.7	e.00	e.15	e.02	e13	15	5.3	.41	5.7	e.42	.00
26	11	2.7	e.00	e.05	e.01	e20	15	4.5	.40	5.4	e.40	.00
27	11	2.4	e.00	e.05	e.00	e45	14	3.6	1.2	7.3	e.40	.00
28	9.7	2.2	e.00	e.03	e.00	e41	14	2.9	1.6	6.9	e.35	.00
29	8.2	2.2	e.00	e.01	---	e34	14	2.5	1.2	5.9	e.30	.00
30	7.4	2.2	e.00	e.00	---	e30	12	2.1	.80	4.8	e.25	.00
31	5.3	---	e.00	e.00	---	e32	---	1.8	---	4.5	e.20	---
TOTAL	1094.60	104.3	27.05	0.32	0.10	820.22	1259	223.8	31.87	579.60	44.95	0.32
MEAN	35.3	3.48	.87	.010	.004	26.5	42.0	7.22	1.06	18.7	1.45	.011
MAX	204	5.9	2.5	.15	.03	200	240	12	2.7	104	4.4	.15
MIN	.00	2.2	.00	.00	.00	.00	12	1.8	.30	.41	.20	.00
AC-FT	2170	207	54	.6	.2	1630	2500	444	63	1150	89	.6

CAL YR 1989 TOTAL 9106.73 MEAN 24.9 MAX 1200 MIN .00 AC-FT 18060
WTR YR 1990 TOTAL 4186.13 MEAN 11.5 MAX 240 MIN .00 AC-FT 8300

e Estimated

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970, 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: August 1983 to current year.
WATER TEMPERATURE: August 1983 to current year.

INSTRUMENTATION.--Water quality monitor since August 1983.

REMARKS.--No flow for several months (see table of daily mean discharge for this station).

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 3,060 microsiemens, Oct. 16, 1989; minimum, 94 micromsiemens, Apr. 5, 1990.
WATER TEMPERATURE: Maximum, 28.6 °C, June 7, 11, 1988; minimum, 0.0 °C several days during winter months each year.
EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 3,060 microsiemens, Oct. 16; minimum, 94 microsiemens, Apr. 5.
WATER TEMPERATURE: Maximum, 25.4 °C, June 28; minimum, 0.0 °C on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT											
13...	1750	219	1680	9.0	17.5	10.0	65	7.3	64	210	32
14...	1125	190	2240	9.0	11.5	8.0	--	--	--	--	--
19...	1135	55	2210	--	14.0	3.5	--	--	--	--	--
30...	1200	7.5	2070	--	4.5	2.5	--	--	--	--	--
NOV											
14...	1300	3.5	2160	8.3	1.0	0.5	30	11.6	81	320	65
MAR											
22...	0930	32	565	7.9	-8.5	0.0	65	7.9	53	160	34
29...	1530	33	580	7.8	7.0	0.0	80	7.0	48	160	36
APR											
05...	1330	108	380	7.7	1.0	0.0	65	10.3	70	120	28
10...	1125	29	540	--	-3.0	1.0	--	--	--	--	--
24...	1655	15	715	--	24.0	18.0	--	--	--	--	--
MAY											
07...	1600	9.1	860	8.1	18.0	15.5	55	8.0	81	230	51
JUN											
21...	1400	0.10	1030	9.1	19.5	19.5	50	8.8	96	220	41
JUL											
18...	1740	16	1370	8.7	20.0	21.0	55	8.0	89	280	38
AUG											
09...	0855	2.0	1700	--	--	22.0	--	--	--	--	--

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT											
13...	31	300	74	9	17	287	440	99	0.30	2.4	1110
NOV											
14...	38	370	70	9	20	326	560	170	1.2	4.0	1430
MAR											
22...	18	47	37	2	14	107	130	19	0.20	8.6	379
29...	16	52	40	2	12	118	110	25	0.20	9.5	305
APR											
05...	13	26	29	1	9.9	95	71	11	0.20	9.8	252
MAY											
07...	25	95	46	3	12	240	140	49	0.50	1.1	542
JUN											
21...	29	140	56	4	12	277	170	70	0.30	1.8	654
JUL											
18...	45	190	58	5	17	256	390	87	0.50	0.80	896

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
OCT										
13...	1100	1.51	656	<0.100	0.030	0.290	0.060	<10	4	50
NOV										
14...	1430	1.94	13.5	<0.100	0.030	0.120	0.050	--	--	--
MAR										
22...	339	0.52	33.1	0.500	0.350	0.280	0.150	30	2	49
29...	334	0.41	27.2	0.500	0.170	0.220	0.110	--	--	--
APR										
05...	228	0.34	73.5	0.200	0.030	0.210	0.070	40	2	37
MAY										
07...	520	0.74	13.3	0.300	0.010	0.280	0.010	--	--	--
JUN										
21...	633	0.89	0.18	<0.100	0.010	0.450	0.360	10	4	39
JUL										
18...	924	1.22	37.7	<0.100	<0.010	0.210	0.110	--	--	--

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT										
13...	930	<1.0	2	<1	2	37	<1	63	8	0.1
NOV										
14...	4600	--	--	--	--	--	--	--	--	--
MAR										
22...	360	<1.0	<5	<3	<10	140	<10	20	180	<0.1
29...	450	--	--	--	--	--	--	--	--	--
APR										
05...	190	<1.0	<5	<3	<10	110	<10	15	61	<0.1
MAY										
07...	680	--	--	--	--	--	--	--	--	--
JUN										
21...	960	2.0	1	1	6	16	<1	41	9	<0.1
JUL										
18...	1800	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT										
13...	5	3	3	<1	<1	320	9	<10	10	<0.010
MAR										
22...	10	7	<10	<1	1	250	<6	<10	6	<0.010
APR										
05...	<10	3	<10	<1	<1	180	<6	20	14	<0.010
JUN										
21...	2	5	6	<1	<1	350	5	<10	6	<0.010

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	2080	2060	2070	2640	2600	2620	---	---	---
2	---	---	---	2100	2060	2070	2720	2640	2670	---	---	---
3	---	---	---	2140	2090	2100	2810	2730	2780	---	---	---
4	---	---	---	2150	2110	2130	2820	2810	2820	---	---	---
5	---	---	---	2110	2100	2100	2820	2760	2790	---	---	---
6	---	---	---	2120	2100	2110	2760	2690	2720	---	---	---
7	---	---	---	2120	2100	2120	2730	2690	2710	---	---	---
8	---	---	---	2100	2090	2100	2750	2730	2740	---	---	---
9	---	---	---	2110	2090	2100	2790	2750	2770	---	---	---
10	---	---	---	2130	2100	2110	2800	2780	2790	---	---	---
11	---	---	---	2120	2100	2110	2820	2790	2800	---	---	---
12	1310	1140	1230	2130	2120	2130	2860	2830	2840	---	---	---
13	2030	1350	1680	2170	2130	2150	---	---	---	---	---	---
14	2620	2040	2260	2200	2160	2180	---	---	---	---	---	---
15	3030	2650	2860	2210	2190	2190	---	---	---	---	---	---
16	3060	2750	2980	2290	2210	2260	---	---	---	---	---	---
17	2740	2280	2480	2360	2280	2310	---	---	---	---	---	---
18	2280	2150	2210	2450	2360	2410	---	---	---	---	---	---
19	2170	2110	2150	2450	2400	2420	---	---	---	---	---	---
20	2170	2120	2140	2400	2370	2390	---	---	---	---	---	---
21	2140	2100	2120	2370	2340	2350	---	---	---	---	---	---
22	2140	2090	2120	2360	2330	2340	---	---	---	---	---	---
23	2140	2120	2130	2430	2350	2390	---	---	---	---	---	---
24	2140	2110	2130	2480	2430	2450	---	---	---	---	---	---
25	2180	2060	2110	2470	2450	2460	---	---	---	---	---	---
26	2120	2070	2100	2460	2440	2450	---	---	---	---	---	---
27	2140	2060	2080	2490	2450	2460	---	---	---	---	---	---
28	2090	2070	2080	2550	2490	2520	---	---	---	---	---	---
29	2090	2070	2080	2570	2550	2560	---	---	---	---	---	---
30	2080	2040	2060	2590	2550	2570	---	---	---	---	---	---
31	2070	2040	2060	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	2590	2060	2270	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	548	527	536	800	770	785
2	---	---	---	---	---	---	527	516	523	810	790	803
3	---	---	---	---	---	---	526	515	521	810	790	800
4	---	---	---	---	---	---	515	145	390	800	760	789
5	---	---	---	---	---	---	344	94	181	800	760	786
6	---	---	---	---	---	---	363	303	338	810	790	805
7	---	---	---	---	---	---	402	353	375	830	810	822
8	---	---	---	---	---	---	461	402	429	830	810	819
9	---	---	---	---	---	---	512	461	483	840	820	826
10	---	---	---	---	---	---	559	520	538	857	820	842
11	---	---	---	---	---	---	568	556	559	860	840	851
12	---	---	---	---	---	---	564	553	556	870	850	860
13	---	---	---	---	---	---	601	553	580	870	850	860
14	---	---	---	---	---	---	620	599	608	890	860	876
15	---	---	---	---	---	---	655	617	634	890	870	882
16	---	---	---	---	---	---	672	644	657	890	870	878
17	---	---	---	---	---	---	689	651	673	900	870	887
18	---	---	---	---	---	---	679	666	672	910	880	901
19	---	---	---	---	---	---	675	663	667	920	900	909
20	---	---	---	---	---	---	692	673	683	920	910	914
21	---	---	---	---	---	---	709	688	697	930	910	921
22	---	---	---	---	---	---	726	698	715	940	920	929
23	---	---	---	---	---	---	733	693	721	940	920	931
24	---	---	---	---	---	---	740	720	730	940	920	936
25	---	---	---	---	---	---	750	720	732	960	940	947
26	---	---	---	---	---	---	770	740	755	960	950	954
27	---	---	---	---	---	---	760	730	757	970	950	959
28	---	---	---	---	---	---	760	710	743	980	960	974
29	---	---	---	---	---	---	740	720	730	990	980	985
30	---	---	---	570	559	563	780	740	761	1010	990	994
31	---	---	---	559	538	550	---	---	---	1010	1000	1000
MONTH	---	---	---	---	---	---	780	94	598	1010	760	885

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1030	1000	1010	900	890	897	---	---	---	---	---	---
2	1020	969	995	910	890	903	---	---	---	---	---	---
3	980	950	964	910	890	903	---	---	---	---	---	---
4	990	970	979	920	900	915	---	---	---	---	---	---
5	981	970	976	930	920	925	---	---	---	---	---	---
6	990	970	980	940	920	927	---	---	---	---	---	---
7	1000	980	990	940	930	937	---	---	---	---	---	---
8	1000	990	991	940	920	933	---	---	---	---	---	---
9	1010	980	997	940	930	937	---	---	---	---	---	---
10	1020	990	1000	950	930	942	---	---	---	---	---	---
11	1020	1000	1010	1070	940	997	---	---	---	---	---	---
12	1030	1000	1020	1120	1060	1090	---	---	---	---	---	---
13	1020	1000	1020	1370	1120	1240	---	---	---	---	---	---
14	1030	1010	1020	1700	1370	1540	---	---	---	---	---	---
15	1020	1010	1020	1720	1650	1690	---	---	---	---	---	---
16	1030	1010	1020	1650	1500	1590	---	---	---	---	---	---
17	1020	1000	1010	1500	1390	1440	---	---	---	---	---	---
18	1010	980	995	1390	1360	1380	---	---	---	---	---	---
19	1000	970	986	1420	1370	1390	---	---	---	---	---	---
20	1000	980	992	1480	1410	1440	---	---	---	---	---	---
21	1010	980	995	1520	1480	1500	---	---	---	---	---	---
22	1010	990	1000	1550	1520	1540	---	---	---	---	---	---
23	1010	990	1000	1580	1550	1570	---	---	---	---	---	---
24	1010	990	1000	---	---	---	---	---	---	---	---	---
25	1020	1000	1010	---	---	---	---	---	---	---	---	---
26	1020	940	1000	---	---	---	---	---	---	---	---	---
27	970	910	935	---	---	---	---	---	---	---	---	---
28	920	850	894	---	---	---	---	---	---	---	---	---
29	890	860	876	---	---	---	---	---	---	---	---	---
30	910	880	897	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	1030	850	986	---	---	---	---	---	---	---	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	1.4	.9	1.2	.0	.0	.0	---	---	---
2	---	---	---	1.0	.0	.4	.0	.0	.0	---	---	---
3	---	---	---	.7	.0	.3	.0	.0	.0	---	---	---
4	---	---	---	1.1	.3	.7	.0	.0	.0	---	---	---
5	---	---	---	1.6	1.0	1.3	.0	.0	.0	---	---	---
6	---	---	---	1.9	1.1	1.5	.0	.0	.0	---	---	---
7	---	---	---	1.9	1.0	1.4	.0	.0	.0	---	---	---
8	---	---	---	1.7	.5	1.0	.0	.0	.0	---	---	---
9	---	---	---	1.2	.4	.7	.0	.0	.0	---	---	---
10	---	---	---	1.4	.0	.6	.0	.0	.0	---	---	---
11	---	---	---	1.5	.2	.7	.0	.0	.0	---	---	---
12	10.3	6.1	7.8	.5	.1	.4	.0	.0	.0	---	---	---
13	9.6	8.2	8.8	.6	.2	.4	---	---	---	---	---	---
14	8.8	8.0	8.5	.3	.0	.2	---	---	---	---	---	---
15	7.9	7.2	7.5	.2	.0	.1	---	---	---	---	---	---
16	7.1	5.8	6.4	.1	.0	.0	---	---	---	---	---	---
17	5.6	4.3	5.0	.0	.0	.0	---	---	---	---	---	---
18	4.2	2.8	3.6	.0	.0	.0	---	---	---	---	---	---
19	4.2	2.5	3.3	.2	.0	.1	---	---	---	---	---	---
20	4.8	2.5	3.7	.2	.0	.1	---	---	---	---	---	---
21	5.6	3.4	4.4	.0	.0	.0	---	---	---	---	---	---
22	6.3	4.3	5.4	.0	.0	.0	---	---	---	---	---	---
23	6.3	5.0	5.8	.0	.0	.0	---	---	---	---	---	---
24	7.2	5.7	6.4	.0	.0	.0	---	---	---	---	---	---
25	7.1	6.0	6.7	.0	.0	.0	---	---	---	---	---	---
26	7.2	6.5	6.9	.0	.0	.0	---	---	---	---	---	---
27	7.2	6.4	7.0	.0	.0	.0	---	---	---	---	---	---
28	6.2	5.1	5.4	.0	.0	.0	---	---	---	---	---	---
29	5.0	3.9	4.3	.0	.0	.0	---	---	---	---	---	---
30	3.7	2.0	2.7	.0	.0	.0	---	---	---	---	---	---
31	2.2	1.5	1.7	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	1.9	.0	.4	---	---	---	---	---	---

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	.0	.0	.0	6.9	3.1	4.9
2	---	---	---	---	---	---	.0	.0	.0	9.3	5.7	7.2
3	---	---	---	---	---	---	.0	.0	.0	11.7	7.2	9.2
4	---	---	---	---	---	---	.0	.0	.0	13.3	9.6	11.2
5	---	---	---	---	---	---	.1	.0	.0	15.0	10.5	12.6
6	---	---	---	---	---	---	.3	.0	.1	16.5	11.5	13.9
7	---	---	---	---	---	---	1.3	.0	.5	15.4	13.5	14.8
8	---	---	---	---	---	---	2.1	.3	1.2	13.6	11.8	12.7
9	---	---	---	---	---	---	3.2	.8	2.0	14.0	10.0	11.9
10	---	---	---	---	---	---	2.5	.8	1.8	14.2	10.3	12.3
11	---	---	---	---	---	---	4.0	.6	2.4	15.2	11.1	13.0
12	---	---	---	---	---	---	5.0	1.6	3.5	15.4	10.4	13.0
13	---	---	---	---	---	---	6.3	3.6	5.0	14.3	12.2	13.2
14	---	---	---	---	---	---	6.8	5.5	6.0	15.7	10.8	13.3
15	---	---	---	---	---	---	8.4	4.7	6.5	13.7	12.0	12.5
16	---	---	---	---	---	---	7.7	5.7	6.7	12.5	10.1	11.2
17	---	---	---	---	---	---	8.4	4.2	6.5	13.7	8.8	11.1
18	---	---	---	---	---	---	9.6	5.3	7.5	12.7	10.2	11.6
19	---	---	---	---	---	---	11.4	8.2	10.0	14.2	10.6	12.2
20	---	---	---	---	---	---	13.3	9.9	11.8	13.5	12.0	12.8
21	---	---	---	---	---	---	15.8	12.3	14.0	16.1	12.7	14.3
22	---	---	---	---	---	---	17.7	14.6	16.1	19.1	13.5	16.2
23	---	---	---	---	---	---	18.8	15.4	17.0	20.0	15.3	17.6
24	---	---	---	---	---	---	18.1	15.5	16.9	20.1	16.7	18.6
25	---	---	---	---	---	---	17.1	14.4	15.6	18.9	16.7	18.0
26	---	---	---	---	---	---	14.3	11.6	13.2	18.7	16.1	17.1
27	---	---	---	---	---	---	11.5	7.3	9.2	19.4	14.9	17.1
28	---	---	---	---	---	---	7.2	5.9	6.6	20.2	16.5	18.4
29	---	---	---	---	---	---	6.3	4.7	5.5	20.1	17.4	18.8
30	---	---	---	.0	.0	.0	5.2	3.8	4.4	20.1	18.1	18.9
31	---	---	---	.0	.0	.0	---	---	---	20.7	17.6	18.9
MONTH	---	---	---	---	---	---	18.8	.0	6.3	20.7	3.1	13.8

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	22.8	18.5	20.6	24.6	22.0	23.4	---	---	---	---	---	---
2	21.0	14.6	17.9	25.4	23.1	24.5	---	---	---	---	---	---
3	17.8	13.1	15.4	24.7	22.4	23.3	---	---	---	---	---	---
4	17.5	14.8	16.2	22.7	19.6	20.6	---	---	---	---	---	---
5	16.2	14.5	15.4	20.6	18.5	19.5	---	---	---	---	---	---
6	20.0	13.6	16.7	19.7	18.0	18.7	---	---	---	---	---	---
7	17.4	16.2	16.8	21.0	19.4	20.2	---	---	---	---	---	---
8	18.6	15.3	16.7	21.3	18.8	20.0	---	---	---	---	---	---
9	19.3	15.6	17.2	21.8	19.3	20.6	---	---	---	---	---	---
10	19.7	17.7	18.9	21.3	20.1	20.7	---	---	---	---	---	---
11	22.6	19.5	21.1	22.5	18.6	21.0	---	---	---	---	---	---
12	21.2	18.0	19.5	23.6	19.9	21.9	---	---	---	---	---	---
13	19.5	16.8	18.2	23.7	20.4	22.2	---	---	---	---	---	---
14	18.4	16.5	17.6	23.7	21.1	22.5	---	---	---	---	---	---
15	18.1	16.3	17.3	23.0	21.0	22.2	---	---	---	---	---	---
16	17.4	16.4	16.7	22.5	20.8	21.8	---	---	---	---	---	---
17	18.0	16.2	17.0	22.3	20.8	21.6	---	---	---	---	---	---
18	18.8	16.7	17.7	21.2	19.3	20.3	---	---	---	---	---	---
19	21.9	18.1	19.6	19.4	18.1	18.8	---	---	---	---	---	---
20	21.3	17.7	19.4	19.6	17.3	18.5	---	---	---	---	---	---
21	21.8	18.2	19.8	19.8	17.1	18.5	---	---	---	---	---	---
22	20.5	18.1	19.4	20.8	17.4	19.3	---	---	---	---	---	---
23	20.4	18.0	19.4	22.0	18.2	20.2	---	---	---	---	---	---
24	22.0	19.1	20.6	---	---	---	---	---	---	---	---	---
25	22.3	20.8	21.7	---	---	---	---	---	---	---	---	---
26	23.9	20.3	21.9	---	---	---	---	---	---	---	---	---
27	23.2	20.3	21.6	---	---	---	---	---	---	---	---	---
28	25.4	21.7	23.4	---	---	---	---	---	---	---	---	---
29	24.7	22.2	23.5	---	---	---	---	---	---	---	---	---
30	23.8	21.6	22.9	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	25.4	13.1	19.0	---	---	---	---	---	---	---	---	---

05114700 LAKE DARLING NEAR GRANO, ND

LOCATION.--Lat 48°36'49", long 101°37'01", in NW¼ sec.11, T.159 N., R.85 W., Renville County, Hydrologic Unit 09010001, at highway bridge 1.3 mi west of Grano.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
MAR										
21...	1445	1230	8.4	0.0	3.5	13	--	--	330	63
APR										
05...	1500	1100	8.2	4.5	6.5	22	11.2	90	280	55
MAY										
07...	1810	1140	8.5	13.5	13.5	13	8.8	86	280	55
JUN										
21...	0830	1260	8.7	15.0	19.0	20	7.2	78	310	60
JUL										
18...	1340	1290	8.6	22.0	21.0	25	7.4	113	300	59
SEP										
05...	1540	1380	8.9	29.5	21.0	28	8.0	92	330	65

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)
MAR										
21...	41	150	49	4	14	336	260	41	0.30	7.6
APR										
05...	35	130	48	3	20	293	220	36	0.20	5.9
MAY										
07...	35	140	50	4	14	303	210	37	0.20	6.5
JUN										
21...	38	160	52	4	14	321	290	51	0.30	3.3
JUL										
18...	38	160	52	4	17	338	280	54	0.30	15
SEP										
05...	41	180	53	4	18	370	330	61	0.30	23

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
MAR										
21...	840	780	1.14	<0.100	0.020	0.120	0.090	<10	4	97
APR										
05...	729	679	0.99	<0.100	0.020	0.150	0.100	<10	4	79
MAY										
07...	754	681	1.03	0.300	0.040	0.270	<0.010	--	--	--
JUN										
21...	832	811	1.13	<0.100	0.010	0.240	0.160	10	7	70
JUL										
18...	834	828	1.13	<0.100	0.010	0.500	0.440	--	--	--
SEP										
05...	950	944	1.29	<0.100	0.080	0.910	0.910	--	--	--

05114700 LAKE DARLING NEAR GRANO, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
MAR										
21...	340	<1.0	<5	<3	<10	9	<10	51	37	<0.1
APR										
05...	300	<1.0	<5	<3	<10	<3	<10	43	8	<0.1
MAY										
07...	380	--	--	--	--	--	--	--	--	--
JUN										
21...	540	<1.0	2	<1	2	<3	<1	48	3	0.2
JUL										
18...	530	--	--	--	--	--	--	--	--	--
SEP										
05...	610	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
MAR										
21...	<10	4	<10	<1	<1	390	<6	10	6	<0.010
APR										
05...	<10	5	<10	<1	<1	340	<6	10	6	<0.010
JUN										
21...	7	5	3	<1	<1	370	5	<10	3	<0.010

05115500 LAKE DARLING NEAR FOXHOLM, ND

LOCATION.--Lat 48°27'27", long 101°35'14", in NE¼NE¼ sec.1, T.157 N., R.85 W., Ward County, Hydrologic Unit 09010001, on control structure of Lake Darling Dam, reservoir of Fish and Wildlife Service, on Souris River about 6 mi north of Foxholm, and at mile 430.0.

DRAINAGE AREA.--9,450 mi², approximately, of which about 6,200 mi² is probably noncontributing.

RESERVOIR-GAGE HEIGHT AND CONTENTS RECORDS

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

REVISED RECORDS.--WSP 1338: 1942. WSP 2113: Drainage area.

GAGE.--Nonrecording gage. Datum of gage is 1,577.00 ft National Geodetic Vertical Datum of 1929. April 1936 to Aug. 8, 1963, nonrecording gages at same site and datum.

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 of 0.0 ft, sill of control gages, and 21.0 ft, crest of spillway. Dead storage, 3,500 acre-ft. Figures given herein represent total contents based on capacity table dated June 7, 1943. Water is used during periods of low flow at wildlife refuge downstream.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 145,400 acre-ft Apr. 17, 1976, gage height, 24.24 ft; minimum observed since April 1943 when reservoir was first filled to spillway level, 31,200 acre-ft, Feb. 18 and 25, 1963, gage height, 10.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 63,000 acre-ft, Apr. 10, gage height, 15.50 ft; minimum observed, 39,800 acre-ft, Sept. 30, gage height, 11.96 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	15.07	59,600	--
Oct. 31	15.08	59,600	0
Nov. 30	15.11	59,900	+300
Dec. 31	15.12	60,000	+100
CAL YR 1989	--	--	+5,300
Jan. 31	15.10	59,800	-200
Feb. 28	15.04	59,300	-500
Mar. 31	15.23	60,800	+1,500
Apr. 30	14.70	56,900	-3,900
May 31	13.45	48,700	-8,200
June 30	13.08	46,500	-2,200
July 31	12.79	44,700	-1,800
Aug. 31	12.42	42,500	-2,200
Sept. 30	11.96	39,800	-2,700
WTR YR 1990	--	--	-19,800

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, ND

LOCATION.--Lat 48°22'20", long 101°30'18", in SW¼SE¼ sec.34, T.157 N., R.84 W., Ward County, Hydrologic Unit 09010001, on left bank 30 ft upstream from county highway bridge, 3 mi east of Foxholm, 19 mi upstream from Des Lacs River, and at mile 414.5.

DRAINAGE AREA.--9,470 mi², approximately, of which about 6,200 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--WSP 1308: 1905. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,560.73 ft above National Geodetic Vertical Datum of 1929. June 23, 1904, to July 31, 1906, nonrecording gage at site 3.2 mi upstream at different datum. Apr. 1, 1937, to Mar. 25, 1938, nonrecording gage at site 600 ft downstream at datum about 0.5 ft higher.

REMARKS.--Estimated daily discharges: Dec. 13 to Mar. 10, July 26-28, and Aug. 10-14. Records good above 1.0 ft³/s and poor below. Flow almost completely regulated since 1936 by Lake Darling (station 05115500) 15 mi upstream and several small reservoirs, combined capacity, about 184,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--54 years, 134 ft³/s, 97,080 acre-ft/yr; median of yearly mean discharges, 52 ft³/s, 37,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,600 ft³/s, Apr. 17, 1976, gage height, 17.17 ft; maximum reverse flow, 25 ft³/s, Apr. 4, 1949 caused by backwater from the Des Lacs River; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 441 ft³/s, Apr. 24, gage height, 7.26 ft; no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.66	.00	e.30	e.10	e.40	.37	205	71	29	2.2	.00
2	.00	.66	.00	e.35	e.10	e.45	.37	231	72	29	2.3	.00
3	.00	.62	.00	e.35	e.10	e.45	.37	230	71	29	2.5	.00
4	.00	.48	.00	e.35	e.10	e.50	.29	230	71	29	2.5	.00
5	.00	.36	.00	e.35	e.15	e.45	.29	227	72	29	2.5	.00
6	.00	.27	.11	e.35	e.15	e.50	.22	223	71	29	2.7	.00
7	.00	.22	.15	e.35	e.15	e.55	.22	216	71	29	5.3	.00
8	.00	.22	.11	e.35	e.20	e.60	.22	210	70	28	6.7	.00
9	.04	.21	.07	e.35	e.20	e.65	.22	207	69	28	5.9	.00
10	.07	.15	.07	e.35	e.20	e.70	.22	198	69	28	e1.0	.00
11	.07	.03	.07	e.35	e.20	.74	.22	133	70	27	e.40	.00
12	.07	.00	.08	e.30	e.20	.76	.24	49	71	26	e.25	.00
13	.11	.00	e.05	e.30	e.20	.77	.29	51	71	26	e.10	.00
14	.20	.00	e.05	e.30	e.20	.74	.28	54	71	26	e.05	.00
15	.29	.00	e.05	e.25	e.15	.74	.22	56	69	25	.00	.00
16	.29	.00	e.05	e.25	e.20	.74	.22	57	69	25	.00	.00
17	.29	.00	e.05	e.25	e.20	.74	.22	58	70	25	.00	.00
18	.36	.00	e.05	e.20	e.20	.74	.19	63	69	20	.00	.00
19	.39	.00	e.05	e.20	e.15	.69	.15	64	69	4.4	.00	.00
20	.48	.00	e.05	e.20	e.15	.66	.14	65	57	4.2	.00	.00
21	.56	.15	e.05	e.20	e.20	.65	.07	65	28	4.2	.00	.00
22	.52	.28	e.05	e.20	e.30	.55	.17	67	28	4.4	.00	.00
23	.58	.35	e.10	e.20	e.30	.47	211	67	28	4.3	.00	.00
24	.59	.37	e.10	e.20	e.30	.44	377	69	29	4.1	.00	.00
25	.61	.37	e.15	e.15	e.30	.39	218	69	29	3.0	.00	.00
26	.66	.37	e.20	e.15	e.30	.37	236	70	28	e1.0	.00	.00
27	.70	.31	e.25	e.15	e.30	.37	254	70	29	e1.0	.00	.00
28	.74	.18	e.30	e.15	e.30	.41	254	70	28	e1.1	.00	.00
29	.68	.04	e.30	e.15	---	.44	226	71	29	1.4	.00	.00
30	.66	.00	e.30	e.10	---	.44	210	70	28	2.1	.00	.00
31	.66	---	e.30	e.10	---	.40	---	71	---	2.2	.00	---
TOTAL	9.62	6.30	3.16	7.80	5.60	17.50	1991.20	3586	1677	524.4	34.40	0.00
MEAN	.31	.21	.10	.25	.20	.56	66.4	116	55.9	16.9	1.11	.000
MAX	.74	.66	.30	.35	.30	.77	377	231	72	29	6.7	.00
MIN	.00	.00	.00	.10	.10	.37	.07	49	28	1.0	.00	.00
AC-FT	19	12	6.3	15	11	35	3950	7110	3330	1040	68	.00

CAL YR 1989 TOTAL 424.64 MEAN 1.16 MAX 73 MIN .00 AC-FT 842
WTR YR 1990 TOTAL 7862.98 MEAN 21.5 MAX 377 MIN .00 AC-FT 15600

e Estimated

05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT											
11...	0800	0.04	1260	--	6.5	8.5	--	--	--	--	--
NOV											
21...	1045	0.16	1460	9.1	-2.5	2.0	35	11.8	86	300	40
JAN											
03...	0915	0.35	2160	--	-9.0	1.0	--	--	--	--	--
FEB											
13...	1100	0.20	2000	7.8	-18.0	1.5	55	0	0	490	86
MAR											
21...	0915	0.70	1440	8.0	-2.0	2.5	25	4.1	30	320	53
APR											
04...	1315	0.30	1200	--	0.0	6.5	--	--	--	--	--
25...	1030	198	1020	--	8.5	13.5	--	--	--	--	--
MAY											
03...	1140	230	1150	8.5	10.5	7.5	12	10.8	89	290	53
08...	0915	214	1140	--	8.0	11.0	--	--	--	--	--
25...	0900	69	1150	8.7	17.0	16.0	12	6.3	64	280	51
JUN											
19...	0930	68	1120	8.7	22.5	19.0	25	5.8	63	270	46
JUL											
17...	1745	25	1120	8.9	23.0	23.5	43	6.4	75	250	39

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
NOV											
21...	48	190	56	5	18	412	260	60	0.30	0.31	905
FEB											
13...	67	270	53	5	26	607	390	85	0.40	14	1380
MAR											
21...	46	190	54	5	19	406	260	62	0.20	8.2	946
MAY											
03...	37	140	50	4	12	324	230	44	0.40	2.0	746
25...	37	140	51	4	13	320	260	39	0.30	0.50	756
JUN											
19...	37	140	52	4	12	305	230	43	0.30	0.70	718
JUL											
17...	36	150	55	4	14	316	210	46	0.20	1.6	708

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV										
21...	865	1.23	0.39	<0.100	0.020	0.320	0.240	--	--	--
FEB										
13...	1310	1.88	0.75	<0.100	2.10	0.620	0.470	10	7	210
MAR										
21...	884	1.29	1.79	<0.100	0.870	0.460	0.250	<10	5	110
MAY										
03...	714	1.01	463	0.200	0.060	0.290	<0.010	<10	8	74
25...	734	1.03	140	<0.100	0.010	0.270	0.200	--	--	--
JUN										
19...	693	0.98	132	<0.100	0.030	0.310	0.260	--	--	--
JUL										
17...	689	0.96	48.4	<0.100	0.030	0.740	0.690	--	--	--

05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV										
21...	350	--	--	--	--	--	--	--	--	--
FEB										
13...	500	1.0	<5	<3	<10	110	<10	90	1300	<0.1
MAR										
21...	360	1.0	<5	<3	<10	12	<10	64	450	<0.1
MAY										
03...	320	<1.0	2	2	1	7	<1	45	23	<0.1
25...	330	--	--	--	--	--	--	--	--	--
JUN										
19...	330	--	--	--	--	--	--	--	--	--
JUL										
17...	340	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB										
13...	20	7	<10	<1	<1	560	<6	<10	<3	<0.010
MAR										
21...	<10	6	<10	<1	<1	350	<6	<10	7	<0.010
MAY										
03...	7	7	4	<1	<1	330	7	10	4	<0.010

05116150 DES LACS RIVER NEAR KENMARE, ND

LOCATION.--Lat 48°35'23", long 101°59'49", in NE¼NE¼NE¼ sec.23, T.159 N., R.88 W., Ward County, Hydrologic Unit 09010001, on right bank 500 ft upstream from crossing on U.S. Highway 52, 150 ft downstream from U.S. Fish and Wildlife Service Dam No. 8, 6.5 mi southeast of Kenmare.

DRAINAGE AREA.--687 mi², approximately, of which 354 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,777 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 30 to Dec. 14 and Mar. 30 to May 3. Records poor. Flow slightly regulated by small upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31 ft³/s, July 12, 1989, gage height, 3.85 ft; no flow much of the time each year.

EXTREMES FOR CURRENT PERIOD.--Maximum daily discharge, 0.40 ft³/s, Apr. 2; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	e.19	e.04	.00	.00	.00	e.30	e.10	.00	.00	.00	.00
2	.09	e.18	e.04	.00	.00	.00	e.40	e.05	.00	.00	.00	.00
3	.09	e.17	e.04	.00	.00	.00	e.30	e.01	.00	.00	.00	.00
4	.09	e.16	e.04	.00	.00	.00	e.15	.00	.00	.00	.00	.00
5	.09	e.15	e.04	.00	.00	.00	e.04	.00	.00	.00	.00	.00
6	.09	e.14	e.04	.00	.00	.00	e.05	.00	.00	.00	.00	.00
7	.12	e.13	e.04	.00	.00	.00	e.06	.00	.00	.00	.00	.00
8	.15	e.12	e.04	.00	.00	.00	e.07	.00	.00	.00	.00	.00
9	.14	e.11	e.04	.00	.00	.00	e.08	.00	.00	.00	.00	.00
10	.11	e.10	e.04	.00	.00	.00	e.10	.00	.00	.00	.00	.00
11	.10	e.09	e.03	.00	.00	.00	e.10	.00	.00	.00	.00	.00
12	.10	e.08	e.02	.00	.00	.00	e.09	.00	.00	.00	.00	.00
13	.10	e.07	e.01	.00	.00	.00	e.08	.00	.00	.00	.00	.00
14	.10	e.05	e.00	.00	.00	.00	e.07	.00	.00	.00	.00	.00
15	.10	e.05	.00	.00	.00	.00	e.06	.00	.00	.00	.00	.00
16	.10	e.05	.00	.00	.00	.00	e.05	.00	.00	.00	.00	.00
17	.10	e.05	.00	.00	.00	.00	e.04	.00	.00	.00	.00	.00
18	.10	e.04	.00	.00	.00	.00	e.03	.00	.00	.00	.00	.00
19	.10	e.04	.00	.00	.00	.00	e.02	.00	.00	.00	.00	.00
20	.12	e.04	.00	.00	.00	.00	e.01	.00	.00	.00	.00	.00
21	.16	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
22	.23	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
23	.20	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
24	.14	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
25	.14	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
26	.14	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
27	.21	e.04	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
28	.23	e.04	.00	.00	.00	.00	e.30	.00	.00	.00	.00	.00
29	.23	e.04	.00	.00	---	.00	e.30	.00	.00	.00	.00	.00
30	e.20	e.04	.00	.00	---	e.10	e.20	.00	.00	.00	.00	.00
31	e.20	---	.00	.00	---	e.20	---	.00	---	.00	.00	---
TOTAL	4.16	2.41	0.46	0.00	0.00	0.30	2.90	0.16	0.00	0.00	0.00	0.00
MEAN	.13	.080	.015	.000	.000	.010	.097	.005	.000	.000	.000	.000
MAX	.23	.19	.04	.00	.00	.20	.40	.10	.00	.00	.00	.00
MIN	.09	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	8.3	4.8	.9	.00	.00	.6	5.8	.3	.00	.00	.00	.00

CAL YR 1989 TOTAL 1169.49 MEAN 3.20 MAX 26 MIN .00 AC-FT 2320
WTR YR 1990 TOTAL 10.39 MEAN .028 MAX .40 MIN .00 AC-FT 21

e Estimated

05116500 DES LACS RIVER AT FOXHOLM, ND

LOCATION.--Lat 48°22'14", long 101°34'11", in NW¼NE¼NW¼ sec 2, T.156 N., R.85 W., Ward County, Hydrologic Unit 09010002, on left bank 200 ft upstream from county highway bridge in Foxholm, and at mile 23.0.

DRAINAGE AREA.--939 mi², of which about 400 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,632.98 ft above National Geodetic Vertical Datum of 1929. June 14 to Oct. 23, 1955, nonrecording gage at site 200 ft downstream from present gage at same datum. See WSP 1728 or 1913 for history of changes prior to June 14, 1955.

REMARKS.--Estimated daily discharges: Oct. 1-10, 14-18, 23-30, Dec. 23-26, Jan. 5, 11, 12, 24, 25, 30, Feb. 5-18, June 9-14, July 16 to Aug. 9, and Aug. 13 to Sept. 7. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--47 years (water years 1905-06, 1946-90), 28.4 ft³/s, 20,580 acre-ft/yr; median of yearly mean discharges, 16 ft³/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,260 ft³/s, Apr. 19, 1979, gage height, 21.23 ft, from high-water mark; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 129 ft³/s, July 3, gage height, 7.28 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.0	.60	.50	.00	.00	.31	5.2	2.7	1.2	.90	e.75	e.15
2	e1.0	.60	.54	.00	.00	.32	8.8	2.6	1.3	4.8	e.80	e.15
3	e1.0	.62	.43	.00	.00	.13	8.9	2.2	1.6	84	e.90	e.15
4	e.45	.75	.47	.00	.00	.07	8.0	1.9	1.7	19	e.95	e.15
5	e.35	.88	.57	e.00	e.00	.03	6.3	1.8	1.7	10	e1.0	e.15
6	e.40	.94	.64	.00	e.00	.01	4.5	1.8	1.5	6.5	e.90	e.10
7	e.45	.94	.52	.00	e.00	.01	3.4	1.9	1.4	20	e.75	e.10
8	e.45	.98	.45	.00	e.00	.04	2.8	2.0	1.3	54	e.60	.10
9	e.45	1.0	.52	.00	e.00	.06	2.4	1.7	e1.2	29	e.55	.10
10	e.50	1.0	.46	.00	e.00	.08	2.1	1.4	e1.1	15	.53	.10
11	1.1	1.0	.33	e.00	e.00	.15	1.9	1.3	e1.1	10	.42	.10
12	.60	1.0	.18	e.00	e.00	.45	1.8	1.3	e1.0	6.4	.39	.09
13	.44	.95	.17	.00	e.00	.67	1.7	1.3	e.90	4.0	e.35	.08
14	e.50	.94	.13	.00	e.00	.77	1.7	1.3	e.85	3.1	e.35	.08
15	e.50	.88	.08	.00	e.00	.87	1.7	1.3	.81	2.9	e.35	.08
16	e.45	.72	.05	.00	e.00	.74	1.6	1.6	.60	e2.0	e.30	.08
17	e.45	.61	.04	.00	e.00	.66	1.5	1.8	.75	e1.2	e.30	.08
18	e.50	.50	.02	.00	e.00	.71	1.6	1.8	1.1	e1.1	e.30	.08
19	1.0	.51	.01	.00	.00	.95	1.5	1.7	1.1	e1.0	e.30	.08
20	.76	.67	.00	.00	.00	1.4	1.5	1.8	.85	e.90	e.30	.08
21	.57	.74	.00	.00	.00	2.2	1.5	1.8	.62	e.80	e.25	.09
22	.54	.76	.00	.00	.01	1.8	1.6	1.6	.51	e.75	e.25	.09
23	e.55	.72	e.01	.00	.08	1.3	1.7	1.5	.41	e.65	e.25	.09
24	e.55	.55	e.01	e.00	.18	.92	1.7	1.4	.33	e.60	e.25	.09
25	e.75	.62	e.01	e.00	.17	.67	1.8	1.4	.30	e.55	e.25	.09
26	e.55	.67	e.01	.00	.13	.70	2.0	1.3	.29	e.55	e.25	.08
27	e.50	.65	.00	.00	.16	.90	2.2	1.3	.53	e.55	e.25	.08
28	e.50	.51	.00	.00	.20	1.2	2.4	1.3	.97	e.50	e.20	.07
29	e.50	.44	.00	.00	---	1.5	2.4	1.2	1.2	e.50	e.20	.07
30	e.69	.49	.00	e.00	---	1.8	2.6	1.1	1.2	e.50	e.20	.07
31	.66	---	.00	.00	---	2.3	---	1.1	---	e.60	e.15	---
TOTAL	18.71	22.24	6.15	0.00	0.93	23.72	88.8	50.2	29.42	282.35	13.59	2.90
MEAN	.60	.74	.20	.000	.033	.77	2.96	1.62	.98	9.11	.44	.097
MAX	1.1	1.0	.64	.00	.20	2.3	8.9	2.7	1.7	84	1.0	.15
MIN	.35	.44	.00	.00	.00	.01	1.5	1.1	.29	.50	.15	.07
AC-FT	37	44	12	.00	1.8	47	176	100	58	560	27	5.8

CAL YR 1989 TOTAL 3446.27 MEAN 9.44 MAX 200 MIN .00 AC-FT 6840
WTR YR 1990 TOTAL 539.01 MEAN 1.48 MAX 84 MIN .00 AC-FT 1070

e Estimated

05116500 DES LACS RIVER AT FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1969-70, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
11...	0830	0.50	1270	--	--	6.0	8.5	--	--	--	--
NOV											
21...	1200	0.77	1750	8.4	--	-2.5	1.0	25	13.3	94	480
MAR											
21...	1030	2.9	1150	8.0	--	-1.0	0.0	25	10.0	68	340
APR											
04...	1400	7.9	1470	--	8.2	0.0	4.5	55	11.0	85	210
MAY											
08...	1045	1.9	1600	8.6	--	13.0	12.5	43	7.8	74	330
JUN											
19...	1145	1.0	1860	8.5	--	23.5	21.5	45	7.4	85	400
JUL											
17...	1825	1.0	950	8.6	--	23.5	24.0	65	8.6	102	230
SEP											
07...	0900	0.10	1480	8.6	--	14.0	18.0	55	4.6	50	330
27...	1230	0.04	1570	--	--	18.5	12.0	--	--	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
NOV											
21...	95	58	190	46	4	11	422	470	31	0.30	2.8
MAR											
21...	70	39	120	43	3	10	273	300	18	0.20	8.2
APR											
04...	43	25	240	70	7	8.3	330	390	18	0.40	6.8
MAY											
08...	62	42	250	61	6	12	409	390	<0.10	<0.10	<0.50
JUN											
19...	75	52	290	60	6	11	514	550	39	0.40	14
JUL											
17...	48	27	120	51	3	12	339	150	15	0.10	18
SEP											
07...	55	46	220	58	5	12	489	350	34	0.30	16

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV											
21...	1140	1110	1.55	2.37	<0.100	0.030	0.080	0.050	--	--	--
MAR											
21...	967	730	1.32	7.57	0.160	0.330	0.200	0.060	--	--	--
APR											
04...	994	930	1.35	21.1	<0.100	0.010	0.350	0.090	20	2	42
MAY											
08...	1070	--	--	--	0.400	<0.010	0.350	<0.010	<10	4	49
JUN											
19...	1290	1340	1.75	3.62	<0.100	0.020	0.810	--	--	10	53
JUL											
17...	619	596	0.84	1.72	<0.100	0.020	0.850	0.670	--	--	--
SEP											
07...	1150	1030	1.56	0.31	<0.100	0.060	0.580	0.450	--	--	--

05116500 DES LACS RIVER AT FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV 21...	110	--	--	--	--	--	--	--	--	--
MAR 21...	50	--	--	--	--	--	--	--	--	--
APR 04...	90	<1.0	<5	3	<10	15	10	54	72	<0.1
MAY 08...	120	<1.0	1	1	1	15	<1	64	26	<0.1
JUN 19...	--	<1.0	1	<1	3	--	1	85	--	<0.1
JUL 17...	110	--	--	--	--	--	--	--	--	--
SEP 07...	170	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR 04...	<10	4	<10	<1	<1	250	<6	10	<3	<0.010
MAY 08...	2	3	3	<1	<1	360	7	10	5	<0.010
JUN 19...	--	4	3	<1	<1	450	6	<10	5	<0.010

05117500 SOURIS (MOUSE) RIVER ABOVE MINOT, ND

LOCATION.--Lat 48°14'45", long 101°22'15", in NW¼NW¼SE¼ sec.17, T.155 N., R.83 W., Ward County, Hydrologic Unit 09010001, on right bank 180 ft downstream from county highway bridge, 3.5 mi west of Minot, 7 mi downstream from Des Lacs River, and at mile 388.5.

DRAINAGE AREA.--10,600 mi², approximately, of which about 6,700 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,545.75 ft above National Geodetic Vertical Datum of 1929. 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 mi 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.

REMARKS.--Estimated daily discharges: Dec. 13 to Jan 1 and Jan. 17-24. Records good except those for periods of estimated daily discharges, which are fair. Flow almost completely regulated by Lake Darling (station 05115500), 41 mi upstream and several smaller reservoirs; combined capacity, about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--87 years, 160 ft³/s, 115,900 acre-ft/yr; median of yearly mean discharges, 85 ft³/s, 61,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s, Apr. 20, 1904, gage height, 21.9 ft at site in Minot, from rating curve extended above 8,100 ft³/s; no flow at times in some years. Maximum stage at present site, about 23 ft in April 1904.

EXTREMES OUTSIDE PERIOD OF RECORD.--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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 281 ft³/s, Apr. 25, gage height, 5.68 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.46	1.3	1.4	e.60	.00	.00	2.8	206	66	23	1.9	.00
2	.11	1.2	1.2	.71	.00	.00	3.2	201	70	27	1.9	.00
3	.00	1.2	.92	.78	.07	.00	3.2	206	72	54	1.1	.00
4	.00	1.3	1.1	.63	.02	.00	2.7	210	70	106	.12	.00
5	.15	1.3	1.1	.63	.37	.00	2.3	212	64	58	.00	.00
6	.73	1.3	1.1	.52	.16	.00	2.1	213	64	37	.00	.00
7	1.1	1.3	.93	.64	.22	.00	2.8	207	62	37	.00	.00
8	1.2	1.3	.93	.78	.30	.14	5.8	206	62	38	1.3	.00
9	1.3	1.2	1.0	.70	.20	.49	3.4	202	61	79	.47	.00
10	1.4	1.1	.99	.84	.19	.70	3.0	201	59	63	.00	.00
11	1.5	1.2	.92	.78	.13	1.2	2.7	199	58	49	1.0	.00
12	1.4	1.1	.91	.48	.42	2.2	2.7	168	56	40	3.0	.00
13	.98	1.5	e.90	.39	.21	3.1	2.9	98	55	34	3.4	.00
14	.98	1.5	e.80	.46	.09	3.4	3.0	70	56	31	3.8	.00
15	1.3	1.5	e.75	.34	.06	3.1	2.8	69	59	27	3.6	.00
16	1.6	1.5	e.65	.39	.00	2.8	2.8	70	61	25	2.8	.00
17	1.9	1.6	e.60	e.35	.00	2.9	2.8	70	68	23	1.9	.00
18	1.5	1.7	e.55	e.30	.00	3.1	2.7	66	66	15	1.1	.00
19	1.4	1.8	e.50	e.25	.00	3.2	2.5	70	61	14	.77	.00
20	1.4	1.6	e.40	e.20	.00	4.1	2.5	72	57	14	.51	.00
21	2.0	1.5	e.35	e.15	.00	3.6	2.1	71	55	13	.15	.00
22	1.2	1.5	e.30	e.20	.00	3.2	1.2	71	48	9.9	.00	.00
23	.84	1.4	e.40	e.25	.00	2.8	.79	68	32	8.4	.00	.00
24	.84	1.3	e.70	e.30	.00	2.7	68	67	23	6.3	.00	.00
25	.75	1.3	e.90	.20	.00	2.8	266	68	20	4.7	.00	.00
26	.82	1.3	e.75	.09	.00	2.6	218	76	19	4.0	.00	.00
27	1.1	1.3	e.80	.26	.00	2.5	203	76	27	4.6	.00	.00
28	.84	1.1	e.80	.07	.00	2.5	216	74	23	4.0	.00	.00
29	.84	1.2	e.75	.14	---	2.5	222	69	22	3.8	.00	.00
30	.84	1.4	e.70	.02	---	2.5	214	67	20	3.3	.00	.00
31	.92	---	e.70	.00	---	2.6	---	66	---	2.4	.00	---
TOTAL	31.40	40.8	24.80	12.45	2.44	60.73	1469.79	3789	1536	858.4	28.82	0.00
MEAN	1.01	1.36	.80	.40	.087	1.96	49.0	122	51.2	27.7	.93	.000
MAX	2.0	1.8	1.4	.84	.42	4.1	266	213	72	106	3.8	.00
MIN	.00	1.1	.30	.00	.00	.00	.79	66	19	2.4	.00	.00
AC-FT	62	81	49	25	4.8	120	2920	7520	3050	1700	57	.00

CAL YR 1989 TOTAL 4189.75 MEAN 11.5 MAX 318 MIN .00 AC-FT 8310
WTR YR 1990 TOTAL 7854.63 MEAN 21.5 MAX 266 MIN .00 AC-FT 15580

e Estimated

05117500 SOURIS RIVER ABOVE MINOT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
10...	1750	1.4	1060	--	21.0	10.5	--	--	--	--	--	--
NOV												
21...	0945	1.4	1330	--	-1.5	2.0	--	--	--	--	--	--
JAN												
03...	0930	0.75	2050	--	-11.0	0.0	--	--	--	--	--	--
FEB												
13...	0945	0.30	2220	--	-18.0	0.0	--	--	--	--	--	--
MAR												
20...	1730	3.9	1640	--	0.0	0.0	--	--	--	--	--	--
MAY												
02...	1715	205	1160	8.3	14.0	9.0	300	54	39	150	51	4
JUN												
15...	0855	59	1170	--	11.5	18.5	--	--	--	--	--	--
JUL												
17...	1550	27	1050	--	22.0	24.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAY											
02...	14	400	0	325	250	44	0.30	0.30	715	747	0.97

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAY											
02...	396	7	280	10	<1	48	10	<0.1	1	<1	410

05120000 SOURIS (MOUSE) RIVER NEAR VERENDRYE, ND

LOCATION.--Lat 48°09'35", long 100°43'45", in NW¼SW¼ sec.17, T.154 N., R.78 W., McHenry County, Hydrologic Unit 09010003, on left bank 2.7 mi north of Verendrye, 19 mi upstream from mouth of Wintering River and at mile 302.0.

DRAINAGE AREA.--11,300 mi², approximately, of which about 6,900 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,464.87 ft above National Geodetic Vertical Datum of 1929. February to June 1933, at site 4 mi upstream at datum 1.65 ft higher. April 1, 1937, to Mar. 3, 1938, non-recording gage at present site, at datum 1.97 ft higher.

REMARKS.--Estimated daily discharges: Dec. 13 to Feb. 12 and Feb. 17-21. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by reservoirs on Souris and Des Lacs Rivers, the largest of which is Lake Darling (station 05115500), 128 mi upstream, combined capacity about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--53 years, 200 ft³/s, 144,900 acre-ft/yr; median of yearly mean discharges, 102 ft³/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s, Apr. 19, 1976, gage height, 17.84 ft; minimum daily flows of 0.3 ft³/s or less occurred in Aug., Sept. 1937, Oct. 1939 and Feb. 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 922 ft³/s, July 5, gage height, 9.65 ft; minimum daily discharge, 1.0 ft³/s, Dec. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	25	6.5	e1.6	e1.6	1.6	15	188	72	121	24	4.9
2	14	21	5.8	e1.7	e1.5	1.6	17	196	82	102	23	4.4
3	18	14	5.3	e1.6	e1.4	2.0	19	193	79	86	22	5.7
4	19	11	4.9	e1.6	e1.4	2.4	23	194	86	335	17	7.6
5	19	9.9	4.7	e1.6	e1.5	3.0	20	193	114	892	15	7.3
6	15	9.9	4.7	e1.6	e1.6	3.0	18	192	116	711	13	6.4
7	12	9.1	4.7	e1.6	1.8	3.3	18	196	98	493	12	6.9
8	11	8.5	5.0	e1.6	1.8	3.5	18	194	91	504	11	5.8
9	11	7.0	5.1	e1.6	1.8	4.5	17	191	135	421	10	5.1
10	9.4	7.4	5.1	e1.6	1.6	6.2	16	187	177	289	9.4	4.8
11	8.3	8.6	5.1	e1.7	1.5	7.7	11	186	134	187	9.2	4.0
12	7.6	6.2	5.2	e1.6	1.7	10	8.8	188	96	135	9.2	3.5
13	7.3	6.5	e4.5	e1.5	1.7	12	9.8	190	76	117	9.2	3.3
14	7.8	4.0	e4.0	e1.5	1.6	11	10	188	69	104	9.2	3.1
15	7.0	4.0	e3.0	e1.5	1.6	7.3	9.9	172	63	91	8.6	3.0
16	6.4	4.2	e2.6	e1.4	1.6	5.1	10	137	59	84	7.0	2.7
17	5.8	4.2	e2.2	e1.4	e1.5	4.7	9.2	101	53	65	6.5	2.6
18	5.2	3.9	e2.0	e1.3	e1.4	7.8	8.2	86	56	59	6.2	2.7
19	4.4	3.7	e1.8	e1.3	e1.3	8.8	7.5	85	67	58	5.4	2.4
20	3.9	3.5	e1.4	e1.3	e1.4	8.1	7.8	73	81	57	5.1	3.3
21	4.5	3.7	e1.2	e1.3	e1.5	7.2	7.2	70	89	52	5.6	3.3
22	5.5	4.3	e1.0	e1.3	1.6	6.0	7.3	70	83	44	6.7	2.8
23	7.1	4.7	e1.1	e1.4	1.6	5.3	8.0	72	78	36	8.6	2.5
24	6.9	6.5	e1.2	e1.4	1.8	4.9	8.0	71	74	33	11	1.9
25	6.5	20	e1.3	e1.5	1.6	5.3	9.8	64	71	30	22	1.6
26	16	26	e1.4	e1.5	1.6	5.9	9.9	69	71	31	28	1.6
27	24	21	e1.5	1.8	1.7	6.7	8.8	82	100	34	25	1.8
28	26	14	e1.5	1.6	1.6	7.2	53	79	83	32	16	2.2
29	26	9.9	e1.6	1.6	---	7.9	167	92	63	32	10	2.3
30	26	7.6	e1.6	1.8	---	8.8	180	99	82	30	7.5	2.5
31	25	---	e1.6	1.8	---	11	---	83	---	27	5.8	---
TOTAL	370.2	289.3	98.6	47.6	44.3	189.8	732.2	4181	2598	5292	378.2	112.0
MEAN	11.9	9.64	3.18	1.54	1.58	6.12	24.4	135	86.6	171	12.2	3.73
MAX	26	26	6.5	1.8	1.8	12	180	196	177	892	28	7.6
MIN	3.9	3.5	1.0	1.3	1.3	1.6	7.2	64	53	27	5.1	1.6
AC-FT	734	574	196	94	88	376	1450	8290	5150	10500	750	222

CAL YR 1989 TOTAL 10225.4 MEAN 28.0 MAX 400 MIN 1.0 AC-FT 20280
WTR YR 1990 TOTAL 14333.2 MEAN 39.3 MAX 892 MIN 1.0 AC-FT 28430

e Estimated

RED RIVER OF THE NORTH BASIN

05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY RECORD

PERIOD OF RECORD.--Water years 1950-51, 1957 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT											
10...	1430	8.9	1620	--	23.5	8.5	--	--	--	--	--
NOV											
20...	1655	3.6	1970	8.1	-1.0	1.5	55	12.8	90	440	97
JAN											
02...	1455	1.7	2000	--	0.0	0.0	--	--	--	--	--
FEB											
12...	1600	1.7	1660	7.6	-8.0	0.0	17	8.3	57	470	120
MAR											
20...	1045	7.7	2100	7.7	4.5	0.5	25	2.4	17	480	110
MAY											
02...	0945	197	1340	8.3	5.0	7.0	32	9.3	75	320	60
23...	1315	74	1460	8.8	22.0	17.5	25	8.2	85	320	61
JUN											
20...	1130	83	1310	8.0	21.0	21.5	35	3.8	43	290	56
JUL											
10...	1800	256	630	--	--	23.5	--	--	--	--	--
17...	1040	64	1020	8.2	18.5	22.5	48	6.8	78	230	49
SEP											
06...	1050	6.1	1420	8.2	23.0	21.5	26	6.5	75	380	78
27...	1705	1.7	1410	--	17.5	14.5	--	--	--	--	--

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
NOV											
20...	47	290	58	6	15	459	460	130	0.40	17	1330
FEB											
12...	42	190	46	4	9.4	456	350	53	0.30	26	1160
MAR											
20...	50	290	56	6	15	521	470	110	0.50	21	1450
MAY											
02...	40	170	53	4	14	385	250	72	0.30	9.0	880
23...	41	200	56	5	14	351	360	73	0.40	2.6	980
JUN											
20...	37	190	57	5	12	328	270	65	0.20	6.6	854
JUL											
17...	27	130	53	4	12	266	200	46	0.20	18	652
SEP											
06...	44	180	50	4	13	426	340	50	<0.10	9.4	938

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV										
20...	1330	1.81	12.8	<0.100	0.050	0.660	0.440	--	--	--
FEB										
12...	1070	1.58	5.20	0.110	0.360	0.320	0.160	<10	4	74
MAR										
20...	1380	1.97	30.1	<0.100	0.800	1.00	0.960	--	--	--
MAY										
02...	847	1.20	468	<0.100	<0.010	0.270	0.150	<10	3	53
23...	964	1.33	194	<0.100	0.020	0.680	0.540	--	--	--
JUN										
20...	837	1.16	191	0.100	0.240	0.800	0.730	<10	8	48
JUL										
17...	644	0.89	113	0.200	0.030	0.660	0.500	--	--	--
SEP										
06...	971	1.28	15.4	<0.100	0.070	0.370	0.320	--	--	--

05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV										
20...	370	--	--	--	--	--	--	--	--	--
FEB										
12...	300	<1.0	<5	<3	<10	10	<10	79	710	<0.1
MAR										
20...	410	--	--	--	--	--	--	--	--	--
MAY										
02...	240	3.0	2	1	2	19	1	55	7	<0.1
23...	360	--	--	--	--	--	--	--	--	--
JUN										
20...	330	<1.0	1	1	1	14	<1	62	62	0.2
JUL										
17...	230	--	--	--	--	--	--	--	--	--
SEP										
06...	320	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB										
12...	20	2	<10	<1	2	730	<6	<10	<3	<0.010
MAY										
02...	2	7	4	<1	<1	360	6	<10	14	<0.010
JUN										
20...	3	5	4	<1	<1	350	5	<10	<3	<0.010

05120500 WINTERING RIVER NEAR KARLSRUHE, ND

LOCATION.--Lat 48°10'14", long 100°32'20", on line between secs.10 and 11, T.154 N., R.77 W., McHenry County, Hydrologic Unit 09010003, on left bank 30 ft upstream from county highway bridge, 4 mi upstream from mouth, and 7 mi northeast of Karlsruhe.

DRAINAGE AREA.--705 mi^2, of which about 420 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

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

REMARKS.--Estimated daily discharges: Dec. 11-20, Jan. 10 to Apr. 12, and June 8 to July 9. Records good except those for periods of estimated daily discharges, which are poor. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes; controlled capacity, about 850 acre-ft.

AVERAGE DISCHARGE.--53 years, 12.7 ft^3/s, 9,200 acre-ft/yr; median of yearly mean discharges, 11 ft^3/s, 8,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,000 ft^3/s, 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 41 ft^3/s, June 2, gage height, 4.57 ft; maximum gage height, 5.72 ft, Mar. 16, backwater from ice; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.87	1.5	.00	e.00	e.50	e3.0	2.9	4.7	e14	.46	.13
2	.05	.97	1.5	.00	e.00	e1.0	e3.0	2.6	37	e11	.44	.12
3	.06	1.1	1.5	.00	e.00	e2.0	e3.2	2.5	24	e13	.42	.13
4	.08	1.4	1.3	.00	e.00	e3.0	e3.4	2.4	16	e10	.35	.12
5	.22	1.7	1.4	.00	e.00	e3.5	e3.6	2.4	12	e8.0	.32	.12
6	.25	1.8	1.7	.00	e.00	e4.0	e3.8	2.6	8.9	e6.0	.33	.12
7	.33	1.8	1.5	.00	e.00	e4.5	e4.0	2.7	6.9	e7.0	.27	.11
8	.35	2.1	1.7	.00	e.00	e5.0	e4.2	2.6	e6.0	e6.0	.20	.11
9	.38	2.0	1.9	.00	e.00	e5.5	e4.4	2.3	e5.5	e8.0	.16	.12
10	.35	1.9	2.0	e.05	e.00	e6.0	e4.5	2.4	e5.0	15	.15	.12
11	.25	1.9	e1.8	e.10	e.00	e7.5	e4.5	2.4	e4.5	13	.15	.13
12	.22	1.9	e1.6	e.10	e.00	e9.5	e4.5	2.3	e4.0	8.1	.20	.13
13	.31	1.8	e1.4	e.10	e.00	e11	4.3	2.2	e3.5	4.7	.15	.13
14	.33	1.7	e1.2	e.05	e.00	e13	4.4	2.2	e3.0	2.5	.15	.11
15	.35	1.6	e1.0	e.05	e.00	e16	3.8	2.7	e2.8	1.9	.14	.12
16	.31	1.5	e.80	e.05	e.00	e18	3.8	7.1	e2.6	1.4	.11	.13
17	.35	1.4	e.60	e.05	e.00	e13	2.6	7.8	e5.0	1.6	.10	.09
18	.35	1.2	e.40	e.05	e.00	e8.0	2.2	5.9	e4.5	1.5	.07	.08
19	.42	1.4	e.20	e.05	e.00	e6.0	2.2	5.0	e4.0	1.5	.11	.07
20	.53	1.6	e.00	e.05	e.00	e5.5	2.5	4.5	e3.9	1.6	.12	.10
21	.58	1.7	.00	e.05	e.10	e5.0	2.4	3.9	e3.8	1.4	.08	.10
22	.67	1.7	.00	e.05	e.20	e4.5	2.6	3.2	e3.3	1.4	.09	.08
23	.70	1.9	.00	e.05	e.25	e5.5	2.4	2.8	e3.1	1.3	.12	.08
24	.78	1.8	.00	e.10	e.20	e6.0	2.3	2.7	e2.9	1.2	.10	.08
25	.81	1.7	.00	e.10	e.15	e5.5	3.1	2.5	e2.6	1.1	.17	.08
26	.82	1.6	.00	e.10	e.10	e5.0	3.7	3.9	e2.5	.90	.15	.09
27	.76	1.8	.00	e.10	e.10	e4.5	5.0	5.8	e10	1.2	.15	.10
28	.81	1.9	.00	e.10	e.30	e4.0	3.6	6.3	e15	.98	.15	.09
29	1.3	2.1	.00	e.10	---	e3.8	3.4	5.1	e17	.72	.14	.08
30	.99	1.8	.00	e.05	---	e3.4	3.1	4.2	e13	.72	.13	.08
31	.81	---	.00	e.05	---	e3.2	---	3.6	---	.65	.13	---
TOTAL	14.57	49.64	25.00	1.55	1.40	192.90	103.5	111.5	237.0	147.37	5.81	3.15
MEAN	.47	1.65	.81	.050	.050	6.22	3.45	3.60	7.90	4.75	.19	.10
MAX	1.3	2.1	2.0	.10	.30	18	5.0	7.8	37	15	.46	.13
MIN	.05	.87	.00	.00	.00	.50	2.2	2.2	2.5	.65	.07	.07
AC-FT	29	98	50	3.1	2.8	383	205	221	470	292	12	6.2

CAL YR 1989 TOTAL 1319.91 MEAN 3.62 MAX 100 MIN .00 AC-FT 2620
WTR YR 1990 TOTAL 893.39 MEAN 2.45 MAX 37 MIN .00 AC-FT 1770

e Estimated

05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954-56, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT											
10...	1240	0.36	560	--	19.0	9.0	--	--	--	--	--
NOV											
20...	1455	1.7	775	7.9	2.5	0.0	35	11.4	77	330	79
MAR											
19...	1620	6.0	510	7.6	7.0	0.0	25	5.9	40	210	52
31...	1125	3.4	538	--	12.0	0.0	--	--	--	--	--
APR											
09...	1800	4.4	490	7.9	6.0	0.5	25	--	--	210	50
MAY											
01...	1125	3.0	670	8.2	5.5	4.5	32	10.5	80	270	64
JUN											
20...	1000	3.8	715	8.0	18.0	18.5	47	4.6	49	300	67
JUL											
16...	1610	1.4	665	7.9	29.0	23.0	49	--	--	270	57
SEP											
06...	1000	0.13	575	7.6	20.0	19.0	23	2.9	32	240	45
26...	1110	0.07	620	--	18.5	13.0	--	--	--	--	--

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
NOV											
20...	33	46	23	1	4.6	354	55	11	0.10	20	460
MAR											
19...	20	26	21	0.8	4.8	221	39	8.8	0.10	20	321
APR											
09...	20	32	25	1	4.2	227	45	8.6	0.20	15	312
MAY											
01...	27	42	25	1	5.0	302	60	12	0.40	17	427
JUN											
20...	31	53	28	1	3.3	340	52	11	0.30	9.7	447
JUL											
16...	30	50	29	1	2.9	339	28	9.1	<0.10	22	413
SEP											
06...	30	37	25	1	4.3	310	15	11	0.20	13	331

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV										
20...	461	0.63	2.07	<0.100	0.020	0.020	0.010	--	--	--
MAR										
19...	303	0.44	5.21	<0.100	<0.010	0.070	0.020	--	--	--
APR										
09...	312	0.42	3.66	<0.100	<0.010	0.090	0.020	<10	1	130
MAY										
01...	409	0.58	3.47	<0.100	<0.010	0.060	0.020	<10	1	150
JUN										
20...	432	0.61	4.61	<0.100	0.030	0.090	0.060	10	2	180
JUL										
16...	403	0.56	1.52	<0.100	0.030	0.150	0.090	--	--	--
SEP										
06...	342	0.45	0.12	<0.100	0.050	0.100	0.070	--	--	--

05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV 20...	100	--	--	--	--	--	--	--	--	--
MAR 19...	70	--	--	--	--	--	--	--	--	--
APR 09...	70	<1.0	<5	<3	<10	49	<10	15	160	<0.1
MAY 01...	110	3.0	1	1	2	19	1	18	15	<0.1
JUN 20...	140	<1.0	1	<1	1	36	<1	27	36	<0.1
JUL 16...	140	--	--	--	--	--	--	--	--	--
SEP 06...	80	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR 09...	<10	3	<10	<1	<1	120	<6	<10	10	<0.010
MAY 01...	<1	2	1	<1	<1	170	3	<10	12	<0.010
JUN 20...	<1	2	<1	<1	<1	190	3	<10	<3	<0.010

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND

LOCATION.--Lat 48°30'20", long 100°26'04", in $SE^1/_4NW^1/_4SE^1/_4$ sec.14, T.158 N., R.76 W., McHenry County, Hydrologic Unit 09010003, on left bank 200 ft upstream from Nelson bridge, 8 mi east of Bantry, 18 mi upstream from Willow Creek, and at mile 228.0.

DRAINAGE AREA.--12,300 mi^2 approximately, of which about 7,600 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,427.56 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 16, 1938, nonrecording gage at same site at datum 0.17 ft lower.

REMARKS.--Estimated daily discharges: Nov. 14 to May 23. Records fair except those for period of estimated daily dicharges, which are 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 mi above station and other other small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--53 years, 218 ft^3/s, 157,900 acre-ft/yr; median of yearly mean discharges, 127 ft^3/s, 92,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,330 ft^3/s, Apr. 23, 1976, gage height, 14.59 ft; no flow at times each year 1937-40, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 448 ft^3/s, July 11, gage height, 7.63 ft; minimum daily discharge, 0.50 ft^3/s, Dec. 21-23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	7.9	e9.0	e.70	e2.4	e2.7	e8.0	e3.8	47	122	44	25
2	2.9	7.9	e9.0	e.70	e2.6	e2.7	e8.5	e4.3	63	125	41	26
3	4.2	11	e9.0	e.70	e2.8	e2.7	e10	e5.0	68	126	38	25
4	6.3	17	e10	e.70	e3.0	e2.6	e11	e5.9	70	122	35	14
5	7.0	18	e10	e.75	e3.2	e2.5	e11	e6.8	84	120	36	11
6	6.7	18	e9.0	e.80	e3.2	e2.4	e12	e8.1	114	121	30	9.3
7	6.0	19	e8.0	e.90	e3.2	e2.6	e12	e10	175	145	28	7.5
8	6.1	19	e8.0	e1.0	e3.2	e3.0	e11	e10	225	264	25	7.3
9	6.4	18	e8.0	e1.2	e3.3	e4.0	e11	e10	250	371	19	4.2
10	7.2	17	e7.0	e1.4	e3.2	e7.0	e9.0	e10	294	421	17	4.5
11	10	16	e6.0	e1.4	e3.2	e11	e8.0	e10	326	444	16	6.4
12	20	15	e5.0	e1.4	e3.1	e13	e7.0	e10	342	448	13	9.5
13	19	14	e5.0	e1.8	e3.1	e15	e6.0	e10	361	438	11	11
14	17	e14	e4.0	e2.0	e3.1	e12	e5.0	e10	375	409	11	9.5
15	15	e13	e3.5	e2.0	e3.0	e9.0	e4.0	e10	371	364	10	8.4
16	13	e13	e3.0	e2.0	e3.0	e11	e3.5	e10	352	312	11	8.2
17	12	e12	e2.5	e1.9	e3.0	e12	e3.0	e10	333	265	8.1	7.5
18	11	e12	e2.0	e1.8	e3.0	e13	e2.5	e10	301	221	5.9	7.4
19	11	e12	e1.5	e1.9	e3.0	e11	e1.8	e10	273	189	5.0	6.5
20	11	e11	e1.0	e2.0	e3.0	e9.0	e1.6	e9.5	246	166	4.0	4.5
21	12	e11	e.50	e2.4	e2.9	e6.0	e1.4	e9.0	220	147	4.8	4.0
22	13	e11	e.50	e2.6	e2.8	e4.0	e1.4	e6.0	194	130	3.6	4.1
23	12	e11	e.50	e2.8	e2.8	e3.5	e1.6	e2.0	171	114	7.7	3.0
24	11	e11	e.60	e2.8	e2.8	e3.0	e1.8	.70	154	102	9.9	1.7
25	11	e10	e.60	e2.8	e2.8	e2.8	e2.0	1.8	142	91	12	1.5
26	9.9	e10	e.70	e2.8	e2.8	e4.0	e2.2	6.6	129	81	7.1	1.6
27	9.1	e10	e.70	e2.7	e2.7	e4.5	e2.5	10	124	76	10	1.9
28	7.9	e10	e.70	e2.8	e2.7	e5.0	e2.9	11	119	68	5.4	1.8
29	7.3	e9.0	e.70	e2.7	---	e6.0	e3.1	16	116	59	4.8	2.0
30	7.5	e9.0	e.70	e2.7	---	e6.5	e3.2	19	117	52	14	1.8
31	7.9	---	e.70	e2.6	---	e7.0	---	31	---	48	19	---
TOTAL	303.8	386.8	127.40	56.75	82.9	200.5	168.0	286.50	6156	6161	506.3	236.1
MEAN	9.80	12.9	4.11	1.83	2.96	6.47	5.60	9.24	205	199	16.3	7.87
MAX	20	19	10	2.8	3.3	15	12	31	375	448	44	26
MIN	2.9	7.9	.50	.70	2.4	2.4	1.4	.70	47	48	3.6	1.5
AC-FT	603	767	253	113	164	398	333	568	12210	12220	1000	468

CAL YR 1989 TOTAL 10045.70 MEAN 27.5 MAX 345 MIN .41 AC-FT 19930
WTR YR 1990 TOTAL 14672.05 MEAN 40.2 MAX 448 MIN .50 AC-FT 29100

e Estimated

05122000 SOURIS RIVER NEAR BANTRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT										
12...	1005	20	1130	--	11.0	8.0	--	--	--	--
NOV										
16...	1130	13	1930	--	-6.0	0.5	--	--	--	--
JAN										
04...	1050	0.69	3100	--	-13.0	0.0	--	--	--	--
FEB										
15...	1215	3.0	2570	--	-12.0	0.0	--	--	--	--
MAR										
23...	1300	3.3	1800	--	-2.0	0.0	--	--	--	--
APR										
02...	1400	8.7	1070	--	3.5	0.0	--	--	--	--
09...	1550	11	935	--	1.0	0.0	--	--	--	--
24...	1305	1.8	2090	--	25.0	18.5	--	--	--	
30...	1650	3.3	1040	--	1.0	6.5	--	--	--	--
MAY										
24...	1115	0.52	990	--	23.0	20.0	--	--	--	--
JUN										
12...	1325	345	1090	8.1	24.5	22.0	290	55	36	140
26...	1330	129	1040	--	29.5	25.5	--	--	--	--
JUL										
20...	1640	162	665	--	24.0	23.5	--	--	--	--
SEP										
04...	1545	13	1110	8.5	21.0	22.5	--	--	--	--
26...	1320	1.5	1240	--	26.0	17.0	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
JUN									
12...	50	4	11	390	0	317	200	48	0.30

DATE	SOLIDS, SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
JUN									
12...	10	717	691	0.98	668	<1	220	40	<1

DATE	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT									
12...	--	--	--	--	--	--	4	0.21	100
NOV									
16...	--	--	--	--	--	--	130	4.5	33
JUN									
12...	48	10	<0.1	<1	<1	320	12	11	45
JUL									
20...	--	--	--	--	--	--	8	3.5	74
SEP									
04...	--	--	--	--	--	--	7	0.25	70

05123400 WILLOW CREEK NEAR WILLOW CITY, ND

LOCATION.--Lat 48°35'20", long 100°26'30", in NE$^1/_4$NW$^1/_4$ sec.23, T.159 N., R.76 W., McHenry County, Hydrologic Unit 09010004, on left bank 50 ft downstream from bridge on county road, 1.5 mi upstream from Snake Creek, and 7 mi west of Willow City.

DRAINAGE AREA.--1,160 mi^2, approximately, of which about 430 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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.

REMARKS.--Estimated daily discharges: June 27 to July 1. Records good except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--34 years, 39.8 ft^3/s, 28,800 acre-ft/yr; median of yearly mean discharges, 19 ft^3/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,900 ft^3/s, Apr. 12, 1969, gage height, 16.76 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 50 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 27	1900	a*0.85	*8.51				

No flow for several months.
a - Backwater from beaver dam

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.05	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	e.50	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	e.85	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	e.50	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	e.10	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.05	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.065	.002	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.85	.05	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	3.9	.1	.00	.00

CAL YR 1989 TOTAL 7317.05 MEAN 20.0 MAX 1230 MIN .00 AC-FT 14510
WTR YR 1990 TOTAL 2.00 MEAN .005 MAX .85 MIN .00 AC-FT 4.0

e Estimated

05123500 STONE CREEK NEAR KRAMER, ND

LOCATION.--Lat 48°40'42", long 100°42'40", in $NW^{1}/_{4}NW^{1}/_{4}NW^{1}/_{4}$ sec.23, T.160 N., R.78 W., Bottineau County, Hydrologic Unit 09010003, on left bank 60 ft upstream from bridge on State Highway 14, 1.0 mi south of Kramer.

DRAINAGE AREA.--168 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal record only).

GAGE.--Water-stage recorder. Datum of gage is 1,425 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to September 16, 1986, nonrecording gage at same site and datum.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed discharge, 636 ft^3/s, Apr. 6, 1989, gage height, 5.89 ft. No flow most of the time each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2.4 ft^3/s, July 11, gage height, 1.70 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.21	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.14	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.70	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	1.2	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.71	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.49	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.35	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.26	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.15	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.20	.00	.00
11	---	---	---	---	---	.00	.02	.00	.00	1.8	.00	.00
12	---	---	---	---	---	.00	.73	.00	.00	1.2	.00	.00
13	---	---	---	---	---	.00	1.8	.00	.00	.69	.00	.00
14	---	---	---	---	---	.00	2.1	.00	.00	.44	.00	.00
15	---	---	---	---	---	.00	1.8	.00	.00	.28	.00	.00
16	---	---	---	---	---	.00	1.5	.00	.00	.18	.00	.00
17	---	---	---	---	---	.00	1.1	.00	.00	.15	.00	.00
18	---	---	---	---	---	.00	.85	.00	.00	.08	.00	.00
19	---	---	---	---	---	.00	.62	.00	.00	.02	.00	.00
20	---	---	---	---	---	.00	.42	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.29	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.19	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.11	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.04	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.23	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.25	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.15	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.10	.00	.04	.00	.00	.00
29	---	---	---	---	---	.00	.03	.00	.27	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.30	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	12.33	0.00	0.61	9.25	0.00	0.00
MEAN	---	---	---	---	---	.000	.41	.000	.020	.30	.000	.000
MAX	---	---	---	---	---	.00	2.1	.00	.30	1.8	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	24	.00	1.2	18	.00	.00

05123510 DEEP RIVER NEAR UPHAM, ND

LOCATION.--Lat 48°35'03", long 100°51'44", in SW¼NW¼ sec.22, T.159 N., R.79 W., McHenry County, Hydrologic Unit 09010005, 60 ft downstream from county highway bridge, 0.8 mi downstream from Little Deep River, and 6.3 mi west of Upham.

DRAINAGE AREA.--975 mi², of which about 605 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1980, March 1985 to current year (seasonal records only since 1985).

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

REMARKS.--Records good.

AVERAGE DISCHARGE.--23 years (water years 1958-80), 20.4 ft³/s, 14,780 acre-ft/yr; median of yearly mean discharges, 0.90 ft³/s, 650 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,760 ft³/s, Apr. 12, 1969, gage height, 18.18 ft; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1951 reached a stage of about 16 ft, discharge, 2,700 ft³/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--No flow for the period of operation, Feb. 1 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	.000	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00

05123750 CUT BANK CREEK AT UPHAM, ND

LOCATION.--Lat 48°4'29", long 100°44'39", in $SE^1/_4SE^1/_4SW^1/_4$ sec.21, T.159 N., R.78 W., McHenry County, Hydrologic Unit 09010005, on left bank 50 ft downstream from county highway bridge, and 0.5 mi southwest of Upham.

DRAINAGE AREA.--722 mi^2, of which about 450 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to September 1980. March 1986 to current year (seasonal records only since 1986).

GAGE.--Water-stage recorder. Datum of gage is 1,422.77 ft above National Geodetic Vertical Datum of 1929. From March to September 1986 nonrecording gage at same site and datum.

REMARKS.--Records good.

AVERAGE DISCHARGE.--6 years (1975-80), 13.7 ft^3/s, 9,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 820 ft^3/s, Apr. 1, 1976, gage height, 7.24 ft from high water mark; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--No flow for the period of operation, Feb. 1 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
13	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
14	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
15	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
16	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	.000	.000	.000	.000	.000	.000	.000	.000
MAX	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
MIN	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00

05123900 BOUNDARY CREEK NEAR LANDA, ND

LOCATION.--Lat 48°48'46", long 100°51'46" at east line sec.35, T.162 N., R.79 W., Bottineau County, Hydrologic Unit 09010003, on right bank 80 ft downstream from bridge on county road, 5 mi upstream from mouth, and 6 mi southeast of Landa.

DRAINAGE AREA.--230 mi^2, of which about 60 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1981, March 1985 to September 1985 (seasonal records only since 1985).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,420.03 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Apr. 6 to May 3 and July 2 to Aug. 9. Records fair.

AVERAGE DISCHARGE.--24 years (1958-1981), 12.3 ft^3/s, 8,910 acre-ft/yr; median of yearly mean discharges, 5.5 ft^3/s, 4,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,580 ft^3/s, Apr. 9, 1969, gage height, 12.70 ft; maximum gage height, 12.90 ft, Apr. 1, 1976, backwater from ice and snow; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 15 ft^3/s, July 10, gage height, 8.05 ft, backwater from beaver dam; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	e.44	.00	.00	e3.0	.00
2	---	---	---	---	---	.00	.00	e.26	.00	e.46	e2.7	.00
3	---	---	---	---	---	.00	.00	e.07	.00	e2.1	e2.3	.00
4	---	---	---	---	---	.00	.00	.00	.00	e3.3	e1.8	.00
5	---	---	---	---	---	.00	.00	.00	.00	e3.4	e1.4	.00
6	---	---	---	---	---	.00	e6.0	.00	.00	e3.0	e.96	.00
7	---	---	---	---	---	.00	e6.0	.00	.00	e3.1	e.64	.00
8	---	---	---	---	---	.00	e5.0	.00	.00	e3.2	e.29	.00
9	---	---	---	---	---	.00	e4.6	.00	.00	e6.3	e.01	.00
10	---	---	---	---	---	.00	e4.0	.00	.00	e14	.00	.00
11	---	---	---	---	---	.00	e3.4	.00	.00	e14	.00	.00
12	---	---	---	---	---	.00	e2.7	.00	.00	e12	.00	.00
13	---	---	---	---	---	.00	e2.2	.00	.00	e10	.00	.00
14	---	---	---	---	---	.00	e1.9	.00	.00	e8.8	.00	.00
15	---	---	---	---	---	.00	e1.7	.00	.00	e7.7	.00	.00
16	---	---	---	---	---	.00	e1.6	.00	.00	e6.5	.00	.00
17	---	---	---	---	---	.00	e1.5	.00	.00	e5.5	.00	.00
18	---	---	---	---	---	.00	e1.6	.00	.00	e4.8	.00	.00
19	---	---	---	---	---	.00	e1.3	.00	.00	e3.9	.00	.00
20	---	---	---	---	---	.00	e1.0	.00	.00	e3.6	.00	.00
21	---	---	---	---	---	.00	e.77	.00	.00	e3.8	.00	.00
22	---	---	---	---	---	.00	e.66	.00	.00	e4.4	.00	.00
23	---	---	---	---	---	.00	e.64	.00	.00	e5.0	.00	.00
24	---	---	---	---	---	.00	e.53	.00	.00	e4.9	.00	.00
25	---	---	---	---	---	.00	e.61	.00	.00	e4.4	.00	.00
26	---	---	---	---	---	.00	e.78	.00	.00	e4.2	.00	.00
27	---	---	---	---	---	.00	e.80	.00	.00	e4.2	.00	.00
28	---	---	---	---	---	.00	e.86	.00	.00	e3.8	.00	.00
29	---	---	---	---	---	.00	e.81	.00	.00	e4.5	.00	.00
30	---	---	---	---	---	.00	e.63	.00	.00	e4.3	.00	.00
31	---	---	---	---	---	.00	---	.00	---	e3.6	.00	---
TOTAL	---	---	---	---	---	0.00	51.59	0.77	0.00	162.76	13.10	0.00
MEAN	---	---	---	---	---	.000	1.72	.025	.000	5.25	.42	.000
MAX	---	---	---	---	---	.00	6.0	.44	.00	14	3.0	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	102	1.5	.00	323	26	.00

e Estimated

05123900 BOUNDARY CREEK NEAR LANDA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1989 to May 1989.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
JUL 21...	0920	3.8	1040	7.6	17.5	19.0	110	1.0	11	250	48

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
JUL 21...	31	130	52	4	10	304	200	31	<0.10	24	736

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
JUL 21...	658	1.00	7.55	<0.100	0.040	0.480	0.460	10	6	46

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
JUL 21...	210	<1.0	<1	<1	1	78	<1	76	20	0.2

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
JUL 21...	<1	1	5	<1	<1	220	13	<10	<3	<0.010

05124000 SOURIS (MOUSE) RIVER NEAR WESTHOPE, ND
(International gaging station)
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 48°59'47", long 100°57'29", in SW¼SE¼ sec.30, T.164 N., R.79 W., Bottineau County, Hydrologic Unit 09010003, on left bank 1,200 ft upstream from second crossing of international boundary, 1 mi downstream from Fish and Wildlife Service Dam 357, 7 mi northeast of Westhope, 11 mi downstream from Boundary Creek, and at mile 154.5.

DRAINAGE AREA.--16,900 mi², approximately, of which about 10,300 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to October 1929, April 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1338: 1932. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and control. Datum of gage is 1,402.45 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 28, 1938, nonrecording gage at site 6.3 mi upstream at datum 2.52 ft higher.

REMARKS.--Estimated daily discharges: Apr. 8 to May 22. Records good. 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 upstream from station.

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

AVERAGE DISCHARGE.--60 years (water years 1931-90), 250 ft³/s, 181,100 acre-ft/yr; median of yearly mean discharges, 138 ft³/s, 100,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft³/s, Apr. 26, 1976, gage height, 19.16 ft; maximum daily reverse flow, 35 ft³/s, Apr. 8, 1943, caused by backwater from downstream tributary inflow; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40 ft³/s, Aug. 27, gage height, 5.96 ft; minimum daily discharge, 0.06 ft³/s, Jan. 16-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	26	.22	.25	.12	.25	.47	e.30	24	27	26	23
2	24	25	.22	.25	.13	.25	.45	e.30	23	26	25	24
3	25	18	.25	.23	.14	.30	.39	e.30	22	28	25	23
4	26	18	.29	.23	.14	.33	.35	e.60	24	26	25	23
5	25	17	.28	.23	.13	.34	.31	e.50	23	26	25	23
6	25	17	.27	.22	.13	.34	.30	e.30	23	27	25	23
7	25	16	.26	.17	.13	.31	.33	e.25	23	27	25	24
8	26	16	.24	.14	.13	.31	e.35	e.25	23	26	25	24
9	25	16	.23	.13	.13	.32	e.35	e.25	23	26	25	24
10	25	16	.23	.11	.13	.32	e.35	e.20	23	27	25	24
11	26	16	.24	.11	.13	.36	e.35	e.20	23	26	25	24
12	28	16	.24	.11	.13	.45	e.35	e.20	23	26	25	23
13	28	16	.23	.10	.12	.54	e.35	e.20	22	25	24	23
14	28	14	.23	.08	.13	.39	e.35	e.20	22	24	24	23
15	27	3.0	.23	.07	.13	.29	e.35	e.30	22	24	24	23
16	28	.54	.23	.06	.12	.22	e.35	e.35	23	24	23	23
17	28	.32	.23	.06	.11	.24	e.35	e.40	25	24	23	24
18	28	.21	.22	.06	.11	.24	e.35	e.40	24	25	23	24
19	26	.17	.22	.06	.11	.30	e.35	e.40	25	25	24	25
20	24	.17	.20	.06	.11	.33	e.30	e.40	25	25	24	24
21	24	.18	.20	.06	.11	.35	e.30	e.40	25	25	24	24
22	24	.20	.16	.06	.11	.33	e.30	e4.2	25	25	25	24
23	26	.19	.17	.06	.11	.33	e.30	3.0	26	25	24	25
24	26	.16	.17	.06	.11	.34	e.30	2.7	26	25	24	25
25	25	.15	.27	.06	.10	.33	e.30	2.7	26	27	24	25
26	25	.13	.26	.06	.14	.34	e.30	2.8	26	26	24	24
27	27	.14	.25	.06	.21	.37	e.30	2.9	25	26	26	25
28	26	.17	.25	.06	.24	.41	e.30	2.9	25	25	26	25
29	26	.16	.26	.07	---	.44	e.30	3.2	26	25	26	25
30	26	.19	.27	.07	---	.45	e.30	7.8	26	25	25	25
31	26	---	.25	.09	---	.46	---	28	---	26	24	---
TOTAL	802	253.08	7.27	3.44	3.64	10.58	10.10	66.90	721	794	762	718
MEAN	25.9	8.44	.23	.11	.13	.34	.34	2.16	24.0	25.6	24.6	23.9
MAX	28	26	.29	.25	.24	.54	.47	28	26	28	26	25
MIN	24	.13	.16	.06	.10	.22	.30	.20	22	24	23	23
AC-FT	1590	502	14	6.8	7.2	21	20	133	1430	1570	1510	1420

CAL YR 1989 TOTAL 20896.45 MEAN 57.3 MAX 1300 MIN .00 AC-FT 41450
WTR YR 1990 TOTAL 4152.01 MEAN 11.4 MAX 28 MIN .06 AC-FT 8240

e Estimated

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954-64, 1966 to current year.

REMARKS.--Additional radiation and radionuclide data were not available at printing. These data will be available from files at the Bismarck District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT											
11...	1505	26	--	1090	--	17.5	9.0	--	--	--	--
NOV											
15...	1215	3.1	--	1260	8.4	-10.0	0.5	--	4.8	12.2	83
JAN											
03...	1630	0.23	--	2680	--	-3.5	0.5	--	--	--	--
FEB											
14...	0900	0.11	3110	--	7.7	-18.0	0.5	110	18	--	--
MAR											
22...	1445	0.42	--	2760	--	-8.0	2.5	--	--	--	--
APR											
04...	1030	0.35	--	1480	--	-5.0	3.0	--	--	--	--
MAY											
04...	1000	0.30	--	2230	--	11.0	11.0	--	--	--	--
JUN											
22...	1100	25	--	990	8.8	20.5	20.5	25	3.5	--	--
JUL											
19...	1340	25	--	1000	9.3	22.5	20.5	70	6.4	8.9	97
SEP											
05...	0915	24	--	1190	--	17.5	18.5	--	--	--	--
26...	1710	24	--	1300	--	19.0	15.0	--	--	--	--

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
NOV											
15...	<20	<10	380	67	52	130	41	3	19	370	--
FEB											
14...	40	--	1600	330	180	420	36	5	45	--	1090
JUN											
22...	<5	<30	300	49	42	110	43	3	15	--	356
JUL											
19...	<5	<70	260	36	42	120	48	3	17	--	286

DATE	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
NOV											
15...	--	--	260	40	0.30	1.5	837	792	1.14	6.96	<0.010
FEB											
14...	1330	0	860	140	0.50	5.3	2830	2640	3.85	0.84	<0.010
JUN											
22...	347	43	180	37	0.20	2.5	650	651	0.88	43.5	<0.010
JUL											
19...	203	72	210	41	0.20	12	679	651	0.92	45.3	<0.010

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
NOV 15...	<0.100	0.040	0.030	2.2	0.130	0.040	0.020	<10	2	81	<0.5
FEB 14...	<0.100	0.420	0.380	2.2	0.160	0.100	0.070	<10	4	500	<10
JUN 22...	<0.100	0.020	0.010	1.6	0.270	0.210	0.180	20	4	4	<0.5
JUL 19...	<0.100	0.250	0.150	7.5	0.300	0.180	0.130	20	6	49	<0.5

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)
NOV 15...	--	<1.0	<1	<3	2	12	<1	69	48	<0.1	<10
FEB 14...	510	<1.0	2	1	5	80	<1	200	710	0.1	4
JUN 22...	220	<1.0	1	<3	1	16	<1	55	26	<0.1	<10
JUL 19...	240	2.0	<1	<3	1	54	<1	57	130	<0.1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)
NOV 15...	6	5	<1	<1	<1.0	360	<6	<10	14	2.7	<0.4
FEB 14...	13	12	<1	--	<1.0	1000	5	--	20	--	--
JUN 22...	4	3	<1	--	<1.0	270	<6	<10	7	--	--
JUL 19...	4	1	<1	--	<1.0	240	<6	<10	3	--	--

DATE	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L) (09511)	URANIUM NATURAL DISSOLVED (UG/L AS U) (22703)	CYANIDE TOTAL (MG/L AS CN) (00720)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 11...	--	--	--	--	--	--	--	22	1.5	100
NOV 15...	24	1.2	21	1.1	0.11	2.8	<0.010	38	0.32	87
JAN 03...	--	--	--	--	--	--	--	345	0.21	8
FEB 14...	--	--	--	--	--	--	<0.010	440	0.13	15
MAY 04...	--	--	--	--	--	--	--	188	0.15	46
JUN 22...	--	--	--	--	--	--	<0.010	16	1.1	81
JUL 19...	--	--	--	--	--	1.7	<0.010	66	4.4	74
SEP 05...	--	--	--	--	--	--	--	66	4.2	14

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
JUN							
22...	1100	0.50	60.0	990	8.8	20.5	--
22...	1103	0.50	55.0	990	8.8	20.5	--
22...	1106	0.50	50.0	990	8.8	20.5	7.0
22...	1109	0.50	45.0	990	8.8	20.5	--
22...	1112	0.50	40.0	990	8.8	20.5	6.9
22...	1115	0.50	35.0	990	8.8	20.5	--
22...	1118	0.50	30.0	990	8.8	20.5	6.9
22...	1121	0.50	25.0	990	8.8	20.5	--
22...	1124	0.50	20.0	990	8.8	20.5	--
22...	1127	0.50	15.0	990	8.8	20.5	--
22...	1130	0.50	11.0	990	8.8	20.5	--
JUL							
19...	1340	0.50	48.0	1000	9.3	20.5	8.9
19...	1345	0.50	40.0	1020	9.3	20.5	7.8
19...	1350	0.50	32.0	1020	9.3	20.5	--
19...	1355	0.50	24.0	1020	9.3	20.5	8.9
19...	1400	0.50	16.0	1020	9.3	20.5	--
19...	1405	0.50	8.00	1020	9.3	20.5	9.9

06185500 MISSOURI RIVER NEAR CULBERTSON, MT

LOCATION (REVISED).--Lat 48°07'30", long 104°28'20", in SE¼NW¼ sec.3, T.27 N., R.56 E., Richland County, Hydrologic Unit 10060005, on right bank at upstream side of bridge on State Highway 16, 2.5 mi southeast of Culbertson, 10 mi downstream from Big Muddy Creek, and at river mile 1,620.76.

DRAINAGE AREA.--91,557 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1911 to December 1951, April 1958 to current year.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,883.4 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). July 1 to Nov. 6, 1941, water-stage recorder at site 400 ft upstream at datum 0.11 ft higher. Nov. 7, 1941, to Aug. 17, 1950, water-stage recorder at site 580 ft downstream at present datum. Aug. 18, 1950, to Dec. 31, 1951, nonrecording gage on bridge at present datum. Apr. 1, 1958, to Nov. 1, 1967, water-stage recorder at site 580 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 7 to Mar. 18. Records good except those for period of estimated daily discharges, which are poor. Flow partly regulated by Fort Peck Lake (station number 06131500) and many other reservoirs upstream from station. Diversions for irrigation of about 1,030,400 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at stations. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--41 years (1943-51, 1959-90, after operational level at Fort Peck Lake was reached), 10,630 ft³/s, 7,701,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft³/s, Mar. 26, 1943, gage height, 14.80 ft, from rating curve extended above 30,000 ft³/s; maximum gage height observed, 19.66 ft, Apr. 14, 1979, backwater from ice jam; minimum daily discharge, 575 ft³/s, Nov. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14,000 ft³/s, Jan. 28; maximum gage height, 10.28 ft, Dec. 29, backwater from ice; minimum daily discharge, 5,440 ft³/s, Mar. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7930	10100	11700	e11300	e12300	e12300	5500	7600	7600	7710	7840	8220
2	8160	11100	11600	e11300	e11300	e12800	5670	7490	7600	7660	7990	8220
3	9490	11600	11600	e11800	e10800	e12800	5910	7460	7600	7720	8150	8200
4	10500	11500	11600	e11300	e10300	e12300	6030	7550	7530	7680	8130	8230
5	10500	11500	11500	e11300	e10800	e11300	5970	7650	7430	7640	8090	8280
6	10600	11700	11600	e11300	e10800	e10300	5910	7680	7460	7560	8050	8270
7	10900	11400	e9500	e11800	e11300	e8800	5840	7580	7510	7590	8040	8270
8	11200	11400	e10000	e12300	e12300	e6300	5850	7550	7460	7810	7990	8210
9	11200	11700	e10500	e12800	e12300	e5800	5770	7600	7530	8170	7860	8160
10	10900	11700	e10500	e12800	e11800	e5800	5730	7560	7570	7830	7860	8170
11	11100	11600	e10800	e12800	e11300	e6000	5720	7510	7540	7920	7950	8150
12	10900	11500	e10000	e12300	e12300	e6200	5760	7460	7920	7930	7880	8090
13	10900	11500	e9000	e12800	e13300	e6800	5760	7450	8270	7800	7870	7960
14	10700	11500	e10000	e13300	e12300	e7500	5710	7570	8190	7690	7880	7970
15	10500	11700	e11400	e13300	e11300	e7500	5600	7650	8260	7710	7860	8000
16	10600	11900	e11300	e13300	e11300	e7200	5720	7610	8230	7780	7780	7910
17	10500	11500	e9800	e13300	e10300	e7000	5750	7480	8330	7800	7670	7860
18	10700	11300	e10300	e12800	e10300	e7000	5560	7460	8410	7790	7780	7860
19	10500	11500	e11300	e12300	e10300	7620	5760	7490	8290	7720	7820	7920
20	10600	11600	e10100	e12300	e10800	7590	5790	7560	8220	7690	7820	8000
21	10600	11200	e10100	e12300	e12300	7550	5690	7720	8120	7640	7840	7980
22	10300	10600	e10100	e12800	e12300	7570	5710	7680	7970	7470	7930	7970
23	10500	10800	e9800	e13300	e12300	7700	6290	7580	7060	7700	8020	7970
24	10600	11100	e9400	e13800	e12800	7030	6610	7490	7380	7850	8120	7950
25	10500	11400	e10300	e13800	e12800	6590	6860	7560	7830	7860	8100	7960
26	10800	11700	e10800	e13800	e12800	6970	7340	7580	7810	8030	8200	7950
27	10200	11700	e11300	e13800	e11800	6570	7780	7680	7690	8190	8310	7930
28	9890	11700	e11300	e14000	e12300	6180	7640	7700	7860	8670	8400	7940
29	9750	11800	e11300	e13800	---	5870	7630	7580	7850	8420	8320	7960
30	9720	11900	e11300	e13300	---	5540	7540	7580	7710	8200	8200	8010
31	9950	---	e11300	e12800	---	5440	---	7600	---	8050	8190	---
TOTAL	321290	343200	331100	394000	326900	241920	184400	234710	234230	243280	247940	241570
MEAN	10360	11440	10680	12710	11670	7804	6147	7571	7808	7848	7998	8052
MAX	11200	11900	11700	14000	13300	12800	7780	7720	8410	8670	8400	8280
MIN	7930	10100	9000	11300	10300	5440	5500	7450	7060	7470	7670	7860
AC-FT	637300	680700	656700	781500	648400	479800	365800	465500	464600	482500	491800	479200

CAL YR 1989 TOTAL 3678980 MEAN 10080 MAX 13700 MIN 5940 AC-FT 7297000
WTR YR 1990 TOTAL 3344540 MEAN 9163 MAX 14000 MIN 5440 AC-FT 6634000

e Estimated

06185600 MISSOURI RIVER STAGE GAGE NO. 4 NEAR NOHLY, MT

LOCATION.--Lat 48°02'10", long 104°09'40", in NE¼ sec.1, T.26 N., R.58 E., Richland County, Hydrologic Unit 10060005, on right bank 4.5 mi northwest of Nohly, and at mile 1,595.7.

DRAINAGE AREA.--93,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 18, 1962, at datum 60.00 ft lower.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.20 ft, Mar. 23, 1960, present datum; minimum daily recorded, 6.87 ft, Apr. 18, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.19	12.36	---	---	---	---	---	10.83	---	11.22	11.18	11.39
2	11.24	12.59	---	---	---	---	---	10.82	---	11.18	11.16	11.39
3	11.54	12.97	---	---	---	---	---	10.79	---	11.20	11.28	11.38
4	12.17	13.04	---	---	---	---	---	10.81	---	11.18	11.29	11.37
5	12.35	12.99	---	---	---	---	---	10.85	---	11.16	11.28	11.40
6	12.32	13.06	---	---	---	---	---	10.90	---	11.13	11.25	11.41
7	12.44	13.09	---	---	---	---	---	10.90	---	11.11	11.24	11.40
8	12.56	---	---	---	---	---	---	10.86	---	11.14	11.22	11.39
9	12.63	---	---	---	---	---	---	10.88	---	11.37	11.16	11.35
10	12.57	---	---	---	---	---	---	10.88	---	11.27	11.14	11.34
11	12.58	---	---	---	---	---	---	10.87	---	11.24	11.20	11.35
12	12.57	---	---	---	---	---	---	10.84	---	11.23	11.18	11.33
13	12.53	---	---	---	---	---	---	10.85	---	11.18	11.16	11.28
14	12.55	---	---	---	---	---	---	10.86	11.45	11.12	11.17	11.25
15	12.41	---	---	---	---	---	---	10.93	11.47	11.10	11.16	11.26
16	12.50	---	---	---	---	---	---	11.00	11.50	11.12	11.14	11.23
17	12.51	---	---	---	---	---	---	10.90	11.49	11.15	11.09	11.21
18	12.55	---	---	---	---	---	---	10.86	11.55	11.13	11.12	11.20
19	12.56	---	---	---	---	---	9.74	10.90	11.51	11.12	11.15	11.22
20	12.53	---	---	---	---	---	9.80	10.91	11.48	11.09	11.16	11.29
21	12.59	---	---	---	---	---	9.78	11.00	11.42	11.07	11.19	11.27
22	12.50	---	---	---	---	---	9.75	11.01	11.37	10.96	11.24	11.26
23	12.52	---	---	---	---	---	9.92	10.97	11.04	11.00	11.27	11.25
24	12.59	---	---	---	---	---	10.23	10.91	10.90	11.13	11.32	11.24
25	12.57	---	---	---	---	---	10.36	10.99	11.20	11.14	11.31	11.25
26	12.66	---	---	---	---	---	10.52	10.99	11.26	11.20	11.33	11.26
27	12.66	---	---	---	---	---	10.83	11.01	11.21	11.30	11.41	11.26
28	12.34	---	---	---	---	---	10.88	11.05	11.25	11.42	11.45	11.28
29	12.30	---	---	---	---	---	10.86	10.99	11.44	11.48	11.47	11.28
30	12.22	---	---	---	---	---	10.85	10.98	11.21	11.34	11.40	11.32
31	12.28	---	---	---	---	---	---	11.01	---	11.27	11.38	---
MEAN	12.37	---	---	---	---	---	---	10.91	---	11.19	11.24	11.30
MAX	12.66	---	---	---	---	---	---	11.05	---	11.48	11.47	11.41
MIN	11.19	---	---	---	---	---	---	10.79	---	10.96	11.09	11.20

06185650 MISSOURI RIVER STAGE GAGE NO. 5 AT NOHLY, MT

LOCATION.--Lat 48°00'10", long 104°05'30", in SE¼ sec.16, T.26 N., R.59 E., Richland County, Hydrologic Unit 10060005, at downstream side of bridge, 0.2 mi northwest of Nohly, and at mile 1,587.7.

DRAINAGE AREA.--93,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 77.22 ft, Mar. 15, 1972; minimum daily recorded, 59.12 ft, Nov. 22, 1964.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64.15	65.01	---	---	---	---	---	64.03	64.14	65.65	64.28	64.36
2	64.18	65.16	---	---	---	---	---	64.01	64.29	65.43	64.23	64.36
3	64.39	65.52	---	---	---	---	---	63.95	64.56	65.14	64.33	64.35
4	64.92	65.62	---	---	---	---	---	63.96	64.74	64.96	64.35	64.32
5	65.14	65.57	---	---	---	---	---	63.96	64.66	64.91	64.34	64.35
6	65.11	65.61	---	---	---	---	---	64.00	64.53	64.84	64.31	64.37
7	65.21	65.65	---	---	---	---	---	64.00	64.39	64.79	64.29	64.36
8	65.30	---	---	---	---	---	---	63.95	64.29	64.67	64.27	64.35
9	65.34	---	---	---	---	---	---	63.95	64.31	64.66	64.22	64.32
10	65.29	---	---	---	---	---	---	63.95	64.41	64.59	64.19	64.31
11	65.28	---	---	---	---	---	---	63.94	64.41	64.51	64.23	64.31
12	65.29	---	---	---	---	---	---	63.95	64.59	64.46	64.23	64.29
13	65.26	---	---	---	---	---	---	63.96	64.77	64.40	64.20	64.27
14	65.27	---	---	---	---	---	---	63.96	65.11	64.31	64.20	64.24
15	65.15	---	---	---	---	---	---	64.01	65.76	64.26	64.19	64.24
16	65.21	---	---	---	---	---	---	64.06	65.83	64.27	64.18	64.21
17	65.22	---	---	---	---	---	---	63.99	65.31	64.29	64.14	64.20
18	65.26	---	---	---	---	---	---	63.97	65.03	64.27	64.16	64.17
19	65.26	---	---	---	---	---	---	63.99	64.90	64.27	64.19	64.17
20	65.20	---	---	---	---	---	---	64.00	64.82	64.24	64.19	64.23
21	65.25	---	---	---	---	---	---	64.05	64.74	64.22	64.19	64.21
22	65.18	---	---	---	---	---	---	64.07	64.75	64.17	64.22	64.21
23	65.15	---	---	---	---	---	63.19	64.04	64.70	64.15	64.25	64.19
24	65.20	---	---	---	---	---	63.43	64.00	64.56	64.26	64.29	64.18
25	65.18	---	---	---	---	---	63.57	64.03	64.87	64.28	64.30	64.16
26	65.26	---	---	---	---	---	63.73	64.05	65.20	64.31	64.32	64.17
27	65.33	---	---	---	---	---	63.98	64.07	65.33	64.42	64.38	64.15
28	64.98	---	---	---	---	---	64.09	64.14	65.59	64.49	64.41	64.17
29	64.96	---	---	---	---	---	64.07	64.20	66.12	64.58	64.44	64.18
30	64.89	---	---	---	---	---	64.05	64.18	65.86	64.45	64.37	64.22
31	64.93	---	---	---	---	---	---	64.15	---	64.37	64.36	---
MEAN	65.09	---	---	---	---	---	---	64.02	64.89	64.54	64.27	64.25
MAX	65.34	---	---	---	---	---	---	64.20	66.12	65.65	64.44	64.37
MIN	64.15	---	---	---	---	---	---	63.94	64.14	64.15	64.14	64.15

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT
(National stream quality accounting network station)

LOCATION.--Lat 47°40'42", long 104°09'22", in $SW^1/_4NE^1/_4SW^1/_4$ sec.9, T.22 N., R.59 E., Richland County, Hydrologic Unit 10100004, on left bank at Montana-Dakota Utilities Company powerplant, 0.2 mi downstream from bridge on State Highway 23, 2.5 mi south of Sidney, 3.0 mi downstream from Fox Creek, and at river mile 29.2.

DRAINAGE AREA.--69,103 mi^2. Area at site 4.5 mi upstream, 68,812 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to September 1931 (published as "at Intake"), October 1933 to current year. If monthly figures of diversions to Lower Yellowstone Canal at Intake are added to records at this site, records equivalent to those published as Yellowstone River at Glendive (1898-1910, 1931-34) can be obtained. Monthly discharge only for some periods, published in WSP 1309. Monthly figures of diversions into Lower Yellowstone Canal prior to 1951 published in WSP 1309, 1951-60 published in WSP 1729, 1961-65 published in WSP 1916, 1966-70 published in WSP 2116, and 1971 to current year are published in annual reports.

GAGE.--Water-stage recorder. Datum of gage is 1,881.3 ft National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Jan. 1, 1911, to Sept. 30, 1931, nonrecording gage at site 32 miles upstream at different datum. Apr. 9, 1934, water-stage recorder at two sites within 500 ft of highway bridge 0.2 mi upstream and May 17, 1945, to Apr. 3, 1952, nonrecording gage on same bridge at datum 1.36 ft higher. Apr. 4, 1952, to Nov. 19, 1967, water-stage recorder at site 4.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Dec. 11 to Mar. 13. Water-discharge records good except those for period of estimated daily discharges, which are poor. Some regulation on tributary streams. Diversion for irrigation of about 1,250,000 acres upstream from station. Lower Yellowstone Project Main Canal diverts from left bank in $NW^1/_4$ sec.36, T.18 N., R.56 E., at Lower Yellowstone diversion dam at Intake about 36.6 mi upstream for irrigation of about 52,000 acres of which about one-third lies upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--78 years, 12,790 ft^3/s, 9,266,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 159,000 ft^3/s, June 2, 1921, gage height, 12.6 ft, site and datum then in use; maximum gage height observed, 21.85 ft, Mar. 22, 1947, site and datum then in use (back-water from ice); minimum discharge, 470 ft^3/s, May 17, 1961, gage height, 2.73 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40,700 ft^3/s, June 28, gage height, 12.26 ft; mininum daily, 2,500 ft^3/s, Dec. 23, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4870	6000	6900	e9000	e4500	e12000	6590	14000	15000	31900	7680	5590
2	4870	5980	6780	e8500	e3700	e11500	6440	13100	20900	29600	7460	5300
3	4910	5800	7030	e8400	e4000	e10500	6310	12300	24000	27300	7190	5210
4	5000	5800	6700	e8200	e4300	e10000	6230	11500	24400	25700	6800	5210
5	5390	6040	6590	e8000	e4500	e9500	6200	10800	22800	25300	6680	5200
6	5940	6130	6680	e8000	e6000	e9000	6290	10200	20800	25400	6530	5070
7	6490	6050	6920	e7800	e7000	e9000	6460	9940	18600	24900	6220	4940
8	6480	6100	6940	e7400	e7600	e8500	6800	9330	18900	21400	5970	4830
9	6400	6210	6990	e7400	e7600	e8800	7440	9140	20300	19300	5710	4670
10	6410	6220	7000	e7400	e7400	e8500	7890	9400	20200	18900	5260	4700
11	6300	6300	e6000	e8000	e7400	e8400	8030	12500	22100	17500	4860	4660
12	6230	6350	e5000	e8400	e7400	e8200	7970	13400	22900	16100	4570	4690
13	6190	6290	e5500	e8600	e7000	e8100	8030	12300	24100	14700	4480	4560
14	6050	6460	e6000	e8800	e6500	8010	8000	11400	30300	13400	4500	4520
15	5910	6650	e6400	e8600	e5400	7820	8020	11000	33900	12500	4540	4470
16	5860	6800	e6500	e8400	e4500	7680	8020	11200	29100	11900	4520	4430
17	5830	6550	e5000	e8000	e4000	7490	8080	11400	23800	11700	4560	4400
18	5800	7520	e5000	e7400	e3800	7200	8220	11600	22100	11400	4480	4500
19	5760	7330	e4800	e7200	e3500	7050	8620	11200	21400	10600	4370	4480
20	5730	7230	e4200	e7000	e4300	7060	9590	10700	20300	9840	4290	4570
21	5680	7200	e3700	e6800	e4800	7120	10200	10300	20600	9300	4450	4580
22	5520	7230	e2900	e6600	e6000	7070	10000	10100	22500	9120	6890	4560
23	5360	7180	e2500	e6400	e7400	7040	10700	10200	24000	8660	5630	4550
24	5450	7040	e2800	e6400	e8000	6970	11400	10300	24800	8550	5990	4650
25	5440	7040	e3000	e6600	e8500	6990	13800	10400	27700	9090	7670	4860
26	5430	7020	e3500	e6800	e9500	6970	14900	10400	29400	9910	7910	4950
27	5840	7020	e4000	e7000	e10000	6630	14800	11800	31600	9460	6680	5050
28	5860	7190	e4500	e6800	e11000	6480	15700	15400	36600	8120	6440	4960
29	5550	7310	e8000	e6600	---	6240	15500	16400	35500	7750	6410	5050
30	5520	7000	e11000	e6600	---	6390	14300	15300	33800	7880	6400	5010
31	5740	---	e10500	e5400	---	6560	---	14200	---	7760	6060	---
TOTAL	177810	199040	179330	232500	175600	248770	280530	361210	742400	474940	181200	144220
MEAN	5736	6635	5785	7500	6271	8025	9351	11650	24750	15320	5845	4807
MAX	6490	7520	11000	9000	11000	12000	15700	16400	36600	31900	7910	5590
MIN	4870	5800	2500	5400	3500	6240	6200	9140	15000	7750	4290	4400
AC-FT	352700	394800	355700	461200	348300	493400	556400	716500	1473000	942000	359400	286100

CAL YR 1989 TOTAL 3320180 MEAN 9096 MAX 36700 MIN 800 AC-FT 6586000
WTR YR 1990 TOTAL 3397550 MEAN 9308 MAX 36600 MIN 2500 AC-FT 6739000

e Estimated

06329590 YELLOWSTONE RIVER STAGE GAGE NO. 1 NEAR FAIRVIEW, MT

LOCATION.--Lat 47°48'34", long 104°02'36", sec. 18, T.150 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on left bank 3 mi south of Fairview, and at mile 15.2.

DRAINAGE AREA.--70,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 19, 1962, at datum 60.00 ft lower.

REVISED RECORDS.--WDR ND-82: 1980-81.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.78 ft, Mar. 21, 1960, present datum; minimum daily recorded, 7.92 ft, Aug. 17, 1988, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.92	10.37	---	---	---	---	---	13.46	13.49	17.08	11.18	10.24
2	9.93	10.44	---	---	---	---	---	13.20	14.91	16.68	11.10	10.09
3	9.95	10.32	---	---	---	---	---	12.85	15.90	16.21	11.02	10.01
4	9.99	10.31	---	---	---	---	---	12.62	---	15.85	10.89	10.02
5	10.11	10.37	---	---	---	---	---	12.35	---	15.77	10.82	10.03
6	10.35	10.45	---	---	---	---	---	12.10	---	15.70	10.77	9.98
7	10.67	10.42	---	---	---	---	---	12.01	---	15.67	10.60	9.94
8	10.71	---	---	---	---	---	---	11.87	---	15.01	10.48	9.89
9	10.67	---	---	---	---	---	---	11.79	---	14.44	10.37	9.85
10	10.65	---	---	---	---	---	---	11.84	---	14.40	10.21	9.89
11	10.57	---	---	---	---	---	---	12.55	---	14.08	10.02	9.91
12	10.54	---	---	---	---	---	---	13.22	---	13.69	9.89	9.94
13	10.51	---	---	---	---	---	---	12.82	---	13.33	9.81	9.89
14	10.44	---	---	---	---	---	---	12.52	16.68	12.98	9.82	9.89
15	10.35	---	---	---	---	---	---	12.36	17.60	12.74	9.80	9.87
16	10.32	---	---	---	---	---	---	12.39	16.90	12.57	9.80	9.88
17	10.32	---	---	---	---	---	---	12.52	15.77	12.46	9.81	9.85
18	10.30	---	---	---	---	---	---	12.65	15.26	12.38	9.79	9.91
19	10.28	---	---	---	---	---	11.48	12.49	15.10	12.21	9.74	9.95
20	10.28	---	---	---	---	---	11.81	12.33	14.89	12.01	9.69	10.01
21	10.25	---	---	---	---	---	12.08	12.19	14.85	11.83	9.70	10.03
22	10.20	---	---	---	---	---	12.00	12.11	15.23	11.77	10.49	10.04
23	10.09	---	---	---	---	---	12.20	12.10	15.62	11.64	10.30	10.02
24	10.13	---	---	---	---	---	12.37	12.15	15.71	11.55	10.30	10.07
25	10.13	---	---	---	---	---	13.11	12.15	16.28	11.68	10.92	10.18
26	10.12	---	---	---	---	---	13.60	12.15	16.62	11.95	11.29	10.20
27	10.31	---	---	---	---	---	13.62	12.44	16.94	11.88	10.77	10.25
28	10.38	---	---	---	---	---	13.90	13.56	17.70	11.47	10.59	10.20
29	10.20	---	---	---	---	---	13.95	14.15	17.79	11.26	10.58	10.20
30	10.19	---	---	---	---	---	13.61	13.93	17.42	11.28	10.57	10.11
31	10.27	---	---	---	---	---	---	13.56	---	11.26	10.43	---
MEAN	10.29	---	---	---	---	---	---	12.59	---	13.32	10.37	10.01
MAX	10.71	---	---	---	---	---	---	14.15	---	17.08	11.29	10.25
MIN	9.92	---	---	---	---	---	---	11.79	---	11.26	9.69	9.85

06329610 YELLOWSTONE RIVER STAGE GAGE NO. 2 NEAR CARTWRIGHT, ND

LOCATION.--Lat 47°51'50", long 103°58'06", on south line sec.26, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on bridge on State Highway 23, 2 mi west of Cartwright, and at mile 8.6.

DRAINAGE AREA.--70,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above National Geodetic Vertical Datum of 1929.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 87.08 ft, Mar. 23, 1978; minimum daily recorded, 58.58 ft, July 26, 1974.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64.55	64.86	---	---	---	---	---	67.69	67.76	---	65.69	64.89
2	64.52	64.92	---	---	---	---	---	67.49	68.98	---	65.63	64.79
3	64.53	64.89	---	---	---	---	---	67.21	70.05	---	65.52	64.72
4	64.57	64.88	---	---	---	---	---	67.05	70.32	---	65.36	64.68
5	64.63	64.91	---	---	---	---	---	66.79	70.01	---	65.30	64.70
6	64.76	64.97	---	---	---	---	---	66.58	69.58	---	65.29	64.66
7	65.04	64.94	---	---	---	---	---	66.36	68.96	---	65.16	64.59
8	65.12	---	---	---	---	---	---	66.21	68.79	---	65.05	64.56
9	65.10	---	---	---	---	---	---	66.13	69.19	---	64.94	64.50
10	65.09	---	---	---	---	---	---	66.15	69.22	---	64.79	64.52
11	65.03	---	---	---	---	---	---	66.75	69.47	---	64.61	64.53
12	65.01	---	---	---	---	---	---	67.56	69.84	68.19	64.50	64.55
13	65.00	---	---	---	---	---	---	67.22	69.84	67.89	64.46	64.48
14	64.94	---	---	---	---	---	---	66.91	70.80	67.55	64.43	64.45
15	64.88	---	---	---	---	---	---	66.75	71.98	67.24	64.48	64.45
16	64.85	---	---	---	---	---	---	66.69	71.57	67.05	64.50	64.44
17	64.85	---	---	---	---	---	---	66.77	70.42	66.95	64.45	64.43
18	64.84	---	---	---	---	---	---	66.87	---	66.83	64.41	64.45
19	64.84	---	---	---	---	---	---	66.83	---	66.66	64.41	64.47
20	64.85	---	---	---	---	---	66.13	66.66	---	66.43	64.40	64.51
21	64.84	---	---	---	---	---	66.40	66.55	---	66.23	64.42	64.50
22	64.83	---	---	---	---	---	66.37	66.46	---	66.19	65.03	64.48
23	64.73	---	---	---	---	---	66.50	66.43	---	66.07	65.05	64.50
24	64.77	---	---	---	---	---	66.64	66.50	---	65.98	64.92	64.57
25	64.76	---	---	---	---	---	67.28	66.48	---	66.11	65.43	64.62
26	64.75	---	---	---	---	---	67.78	66.53	---	66.40	65.87	64.66
27	64.81	---	---	---	---	---	67.80	66.73	---	66.40	65.40	64.69
28	64.87	---	---	---	---	---	68.03	67.76	---	65.98	65.21	64.64
29	64.77	---	---	---	---	---	68.16	68.44	---	65.72	65.17	64.62
30	64.74	---	---	---	---	---	67.83	68.24	---	65.73	65.18	64.58
31	64.80	---	---	---	---	---	---	67.90	---	65.76	65.07	---
MEAN	64.83	---	---	---	---	---	---	66.93	---	---	64.97	64.57
MAX	65.12	---	---	---	---	---	---	68.44	---	---	65.87	64.89
MIN	64.52	---	---	---	---	---	---	66.13	---	---	64.40	64.43

06329620 YELLOWSTONE RIVER STAGE GAGE NO. 3 NEAR BUFORD, ND

LOCATION.--Lat 47°55'14", long 103°57'56", in SW¼ sec.2, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on left bank 4 mi south of Buford, and 6.5 mi southeast of Nohly.

DRAINAGE AREA.--70,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 19, 1962, at datum 50.00 ft lower. Prior to Apr. 23, 1987, gage was located 1 mi downstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.55 ft, Mar. 15, 1972; minimum daily recorded, 6.18 ft, Aug. 24, 1961, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	13.86	13.85	17.95	11.78	10.75
2	---	---	---	---	---	---	---	13.64	15.04	17.53	11.71	10.55
3	---	---	---	---	---	---	---	13.24	16.28	17.03	11.62	10.43
4	---	---	---	---	---	---	---	13.06	16.59	16.63	11.46	10.40
5	10.19	---	---	---	---	---	---	12.74	16.38	16.48	11.36	10.40
6	10.47	---	---	---	---	---	---	12.46	15.88	16.38	11.31	10.35
7	10.87	---	---	---	---	---	---	12.34	15.13	16.43	11.14	10.26
8	11.06	---	---	---	---	---	---	12.20	14.85	15.88	11.00	10.21
9	11.05	---	---	---	---	---	---	12.06	15.20	15.26	10.86	10.13
10	11.01	---	---	---	---	---	---	12.03	15.28	15.19	10.70	10.12
11	10.96	---	---	---	---	---	---	12.56	15.55	14.92	10.45	10.13
12	10.91	---	---	---	---	---	---	13.54	15.98	14.54	10.26	10.11
13	10.88	---	---	---	---	---	---	13.29	16.07	14.21	10.12	10.09
14	---	---	---	---	---	---	---	---	17.04	13.87	10.10	10.05
15	---	---	---	---	---	---	---	---	18.29	13.56	10.12	10.02
16	---	---	---	---	---	---	---	---	18.01	13.34	10.13	9.99
17	---	---	---	---	---	---	---	---	16.80	13.21	10.10	9.95
18	---	---	---	---	---	---	---	---	16.05	13.12	10.13	9.99
19	---	---	---	---	---	---	11.50	---	15.82	12.94	10.07	10.00
20	---	---	---	---	---	---	11.83	---	15.68	12.70	10.02	10.08
21	---	---	---	---	---	---	12.15	---	15.56	12.49	9.97	10.07
22	---	---	---	---	---	---	12.14	---	15.82	12.41	10.68	10.06
23	---	---	---	---	---	---	12.25	---	16.28	12.29	10.83	10.02
24	---	---	---	---	---	---	12.45	---	16.36	12.15	10.73	10.06
25	---	---	---	---	---	---	13.13	---	16.86	12.22	11.32	10.16
26	---	---	---	---	---	---	13.78	---	17.28	12.55	11.89	10.21
27	---	---	---	---	---	---	13.92	---	17.55	12.62	11.40	10.26
28	---	---	---	---	---	---	14.16	---	18.23	12.19	11.13	10.25
29	---	---	---	---	---	---	14.44	---	18.75	11.91	11.08	10.19
30	---	---	---	---	---	---	14.10	14.42	18.30	11.88	11.07	10.11
31	---	---	---	---	---	---	---	14.03	---	11.87	10.98	---
MEAN	---	---	---	---	---	---	---	---	16.36	14.06	10.82	10.18
MAX	---	---	---	---	---	---	---	---	18.75	17.95	11.89	10.75
MIN	---	---	---	---	---	---	---	---	13.85	11.87	9.97	9.95

06329640 MISSOURI RIVER STAGE GAGE NO. 5A AT BUFORD, ND

LOCATION.--Lat 47°59'06", long 103°59'05", in SE¼ sec.15, T.152 N., R.104 W., Williams County, Hydrologic Unit 10110101, on left bank 1.5 mi southwest of Buford, and at mile 1,580.7.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1960 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 8, 1962, at datum 50.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 19.37 ft, Mar. 23, 1978; minimum daily recorded, 2.63 ft, Aug. 15, 16, 1966.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	6.99	---	10.45	14.43	8.51	7.78
2	---	---	---	---	---	---	6.99	---	11.32	14.03	8.42	7.63
3	---	---	---	---	---	---	6.94	---	12.53	13.55	8.38	7.53
4	---	---	---	---	---	---	6.96	---	12.92	13.15	8.29	7.49
5	---	---	---	---	---	---	6.94	---	12.74	12.98	8.19	7.47
6	---	---	---	---	---	---	6.95	---	12.35	12.86	8.15	7.46
7	---	---	---	---	---	---	6.98	---	---	12.87	7.98	7.42
8	---	---	---	---	---	12.70	7.05	---	---	12.42	7.84	7.39
9	---	---	---	---	---	12.64	7.23	---	---	11.85	7.72	7.32
10	---	---	---	---	---	12.86	7.46	---	---	11.74	7.57	7.30
11	---	---	---	---	---	12.74	7.63	---	---	11.46	7.43	7.31
12	---	---	---	---	---	12.89	7.62	---	---	11.12	7.31	7.30
13	---	---	---	---	---	12.27	7.63	---	12.54	10.80	7.19	7.25
14	---	---	---	---	---	---	7.61	---	13.31	10.38	7.18	7.21
15	---	---	---	---	---	---	7.58	---	14.50	10.07	7.19	7.20
16	---	---	---	---	---	---	7.59	---	14.52	9.89	7.17	7.18
17	---	---	---	---	---	---	7.65	9.54	13.54	9.73	7.16	7.13
18	---	---	---	---	---	---	7.67	9.61	12.79	9.68	7.15	7.15
19	---	---	---	---	---	8.32	7.72	9.58	12.48	9.51	7.15	7.17
20	---	---	---	---	---	8.10	8.01	9.42	12.26	9.27	7.15	7.24
21	---	---	---	---	---	8.01	8.31	9.30	12.08	9.08	7.12	7.25
22	---	---	---	---	---	7.93	8.32	9.17	12.27	8.99	7.48	7.26
23	---	---	---	---	---	7.91	8.43	9.11	12.61	8.86	7.93	7.24
24	---	---	---	---	---	7.84	8.80	9.14	12.58	8.78	7.64	7.26
25	---	---	---	---	---	7.58	9.42	9.15	13.05	8.85	8.09	7.32
26	---	---	---	---	---	7.55	---	9.24	13.60	9.17	8.63	7.35
27	---	---	---	---	---	7.50	---	9.33	13.85	9.33	8.32	7.39
28	---	---	---	---	---	7.26	---	10.23	14.40	9.00	8.07	7.39
29	---	---	---	---	---	7.08	---	11.07	15.06	8.81	8.06	---
30	---	---	---	---	---	6.94	---	11.05	14.72	8.73	8.03	7.32
31	---	---	---	---	---	6.94	---	10.71	---	8.68	7.93	---
MEAN	---	---	---	---	---	---	---	---	---	10.65	7.76	---
MAX	---	---	---	---	---	---	---	---	---	14.43	8.63	---
MIN	---	---	---	---	---	---	---	---	---	8.68	7.12	---

06329650 MISSOURI RIVER STAGE GAGE NO. 6 NEAR BUFORD, ND

LOCATION.--Lat 47°57'18", long 103°54'36", in SE¼ sec.30, T.152 N., R.103 W., Williams County, Hydrologic Unit 10110101, on right bank 5 mi southeast of Buford, and at mile 1,576.0.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--December 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 17, 1962, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.18 ft, June 10, 1986; minimum daily recorded, 8.23 ft, Aug. 15, 22, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.22	15.27	---	---	---	---	---	17.63	17.71	21.76	15.68	14.87
2	14.18	15.43	---	---	---	---	---	17.47	18.44	21.37	15.58	14.73
3	14.27	15.67	---	---	---	---	---	17.12	19.75	20.89	15.54	14.67
4	14.69	15.79	---	---	---	---	---	16.92	20.21	20.46	15.44	14.63
5	15.04	15.83	---	---	---	---	---	16.66	20.11	20.26	15.34	14.65
6	15.22	15.90	---	---	---	---	---	16.43	19.70	20.13	15.29	14.63
7	15.51	---	---	---	---	---	---	16.28	19.10	20.14	15.14	14.59
8	15.75	---	---	---	---	---	---	16.15	18.68	19.72	15.01	14.56
9	15.81	---	---	---	---	---	---	15.98	18.86	19.13	14.88	14.50
10	15.78	---	---	---	---	---	---	15.97	19.05	18.99	14.74	14.46
11	15.71	---	---	---	---	---	---	16.22	19.18	18.72	14.60	14.49
12	15.69	---	---	---	---	---	---	17.16	19.64	18.36	14.49	14.48
13	15.66	---	---	---	---	---	---	17.14	19.81	18.02	14.37	14.45
14	15.63	---	---	---	---	---	---	16.84	20.54	17.64	14.34	14.41
15	15.51	---	---	---	---	---	---	16.66	21.76	17.30	14.33	14.40
16	15.46	---	---	---	---	---	---	16.66	21.88	17.09	14.33	14.38
17	15.49	---	---	---	---	---	14.82	16.73	20.94	16.94	14.30	14.34
18	15.49	---	---	---	---	---	14.86	16.81	20.13	16.87	14.31	14.35
19	15.46	---	---	---	---	---	14.91	16.81	19.81	16.72	14.31	14.35
20	15.43	---	---	---	---	---	15.15	16.66	19.57	16.48	14.29	14.43
21	15.42	---	---	---	---	---	15.43	16.55	19.39	16.28	14.25	14.44
22	15.36	---	---	---	---	---	15.49	16.45	19.53	16.17	14.53	14.45
23	15.24	---	---	---	---	---	15.55	16.38	19.88	16.04	15.16	14.42
24	15.27	---	---	---	---	---	15.88	16.39	19.88	15.94	14.79	14.44
25	15.28	---	---	---	---	---	16.41	16.41	20.31	15.99	15.17	14.48
26	15.30	---	---	---	---	---	17.14	16.50	20.86	16.29	15.74	14.51
27	15.56	---	---	---	---	---	17.48	16.57	21.14	16.49	15.57	14.53
28	15.37	---	---	---	---	---	17.72	17.33	21.67	16.19	15.24	14.56
29	15.22	---	---	---	---	---	17.99	18.23	22.39	15.99	15.21	14.53
30	15.12	---	---	---	---	---	17.88	18.28	22.06	15.89	15.18	14.52
31	15.14	---	---	---	---	---	---	17.97	---	15.83	15.03	---
MEAN	15.30	---	---	---	---	---	---	16.82	20.07	17.87	14.91	14.51
MAX	15.81	---	---	---	---	---	---	18.28	22.39	21.76	15.74	14.87
MIN	14.18	---	---	---	---	---	---	15.97	17.71	15.83	14.25	14.34

06329660 MISSOURI RIVER STAGE GAGE NO. 7 NEAR TRENTON, ND

LOCATION.--Lat 47°59'21", long 103°47'57", in NE¼ sec.13, T.152 N., R.103 W., McKenzie County, Hydrologic Unit 10110101, on right bank 5 mi south of Trenton, and at mile 1,566.7.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 7, 1962, at site 0.8 mi upstream. Prior to May 29, 1963, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.56 ft, July 10, 1975; minimum daily recorded, 4.34 ft, Aug. 19, 22, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.64	11.70	---	---	---	---	---	---	13.92	17.96	12.11	11.42
2	10.59	11.85	---	---	---	---	---	---	14.41	17.61	12.01	11.26
3	10.68	12.07	---	---	---	---	---	---	15.68	17.20	11.93	11.17
4	11.06	12.19	---	---	---	---	---	---	16.25	16.78	11.88	11.11
5	11.45	12.22	---	---	---	---	---	---	16.29	16.51	11.80	11.11
6	11.64	12.27	---	---	---	---	---	---	15.94	16.38	11.75	11.11
7	11.91	---	---	---	---	---	---	---	15.40	16.37	11.61	11.06
8	12.14	---	---	---	---	---	---	---	14.94	16.05	11.48	11.02
9	12.19	---	---	---	---	---	---	---	14.96	15.45	11.37	10.97
10	12.17	---	---	---	---	---	---	---	15.15	15.19	11.24	10.93
11	12.10	---	---	---	---	---	---	---	15.28	14.94	11.10	10.97
12	12.07	---	---	---	---	---	---	---	15.70	14.64	11.00	10.93
13	12.03	---	---	---	---	---	---	---	15.93	14.31	10.88	10.93
14	11.99	---	---	---	---	---	---	---	16.46	13.96	10.83	10.87
15	11.88	---	---	---	---	---	---	---	17.59	13.64	10.83	10.86
16	11.84	---	---	---	---	---	---	---	17.94	13.42	10.81	10.82
17	11.87	---	---	---	---	---	11.22	---	17.27	13.27	10.77	10.79
18	11.86	---	---	---	---	---	11.25	12.95	16.48	13.17	10.79	10.81
19	11.86	---	---	---	---	---	11.28	12.99	16.12	13.06	10.78	10.80
20	11.81	---	---	---	---	---	11.47	12.85	15.87	12.84	10.76	10.88
21	11.82	---	---	---	---	---	11.73	12.76	15.67	12.65	10.71	10.89
22	11.77	---	---	---	---	---	---	12.65	15.71	12.54	10.91	10.89
23	11.63	---	---	---	---	---	---	12.55	15.97	12.44	11.60	10.88
24	11.66	---	---	---	---	---	---	12.54	16.05	12.33	11.25	10.90
25	11.67	---	---	---	---	---	---	12.59	16.35	12.27	11.56	10.93
26	11.70	---	---	---	---	---	---	12.68	16.87	12.53	12.07	10.97
27	11.95	---	---	---	---	---	---	12.71	17.19	12.79	12.03	10.98
28	11.79	---	---	---	---	---	---	13.31	17.66	12.62	11.71	10.99
29	11.64	---	---	---	---	---	---	14.19	18.40	12.41	11.66	10.95
30	11.53	---	---	---	---	---	---	14.35	18.23	12.30	11.63	10.94
31	11.58	---	---	---	---	---	---	14.16	---	12.25	11.58	---
MEAN	11.69	---	---	---	---	---	---	---	16.19	14.19	11.37	10.97
MAX	12.19	---	---	---	---	---	---	---	18.40	17.96	12.11	11.42
MIN	10.59	---	---	---	---	---	---	---	13.92	12.25	10.71	10.79

06330000 MISSOURI RIVER NEAR WILLISTON, ND

LOCATION.--Lat 48°06'45", long 103°43'04", in SE¼ sec.31, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, at city waterplant on left bank, 5 mi southwest of Williston, 29.3 mi downstream from Yellowstone River, and at mile 1,552.7.

DRAINAGE AREA.--164,500 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1966 to current year. Operated as a stage-discharge station October 1897 to July 1965.

GAGE.--Water-stage recorder. Datum of gage is 1,830.20 ft above National Geodetic Vertical Datum of 1929. See WSP 1917 for history of changes prior to April 1966.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 26.46 ft, Mar. 26, 1978; minimum daily recorded, 7.80 ft, Nov. 2, 1966.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.94	14.64	15.48	18.83	18.03	19.38	13.84	16.57	16.50	19.27	14.87	14.29
2	13.91	14.75	15.43	18.95	17.39	19.45	13.89	16.44	16.58	19.06	14.74	14.19
3	13.96	14.89	15.30	19.04	16.93	19.48	13.80	16.23	17.44	18.86	14.70	14.03
4	14.18	15.00	15.36	19.02	16.82	19.47	13.82	16.00	18.01	18.58	14.65	13.98
5	14.44	15.06	15.33	19.00	16.70	19.52	13.79	15.81	18.15	18.39	14.57	13.95
6	14.63	15.10	15.33	18.89	16.67	19.55	13.80	15.58	18.06	18.33	14.49	13.97
7	14.79	15.12	15.36	18.79	16.98	19.41	13.82	15.37	17.78	18.24	14.40	13.99
8	15.02	15.14	15.39	18.72	17.31	19.15	13.87	15.29	17.38	18.17	14.26	13.95
9	15.08	15.12	15.34	18.68	17.48	18.94	13.94	15.17	17.25	17.80	14.15	13.92
10	15.12	15.20	15.37	18.68	17.87	18.92	14.09	15.15	17.39	17.54	14.07	13.89
11	15.08	15.23	15.96	18.68	18.16	18.73	14.20	15.21	17.43	17.41	13.98	13.89
12	15.07	15.28	17.14	18.68	18.31	18.30	14.25	15.71	17.66	17.13	13.89	13.89
13	15.06	15.24	17.36	18.74	18.33	18.12	14.25	15.98	17.91	16.90	13.77	13.86
14	15.04	15.23	17.33	18.78	18.44	17.83	14.25	15.93	18.17	16.58	13.71	13.85
15	14.97	15.22	17.49	18.73	18.51	17.48	14.25	15.78	18.80	16.29	13.71	13.84
16	14.89	15.34	17.59	18.69	18.34	17.29	14.23	15.64	19.01	16.05	13.70	13.87
17	14.90	15.50	17.46	18.79	17.95	17.27	14.28	15.73	18.68	15.87	13.68	13.83
18	14.91	15.74	17.15	18.79	17.64	16.97	14.30	15.80	18.26	15.78	13.70	13.80
19	14.88	15.52	16.93	18.72	17.42	15.58	14.29	15.81	18.04	15.70	13.72	13.80
20	14.86	15.43	17.25	18.61	17.26	14.79	14.38	15.72	17.94	15.55	13.71	13.80
21	14.83	15.49	17.62	18.39	17.27	14.63	14.59	15.59	17.80	15.37	13.68	13.85
22	14.81	15.42	17.71	18.17	17.47	14.49	14.68	15.49	17.81	15.25	13.70	13.86
23	14.73	15.36	17.75	18.01	17.75	14.49	14.67	15.40	17.97	15.15	14.24	13.85
24	14.71	15.30	17.58	17.97	18.06	14.45	14.90	15.44	18.10	15.05	14.08	13.82
25	14.73	15.32	17.23	18.16	18.45	14.32	15.16	15.46	18.17	15.06	14.18	13.86
26	14.74	15.37	17.13	18.40	18.81	14.26	15.70	15.48	18.48	15.22	14.66	13.88
27	14.87	15.42	17.24	18.49	19.05	14.29	16.12	15.46	18.76	15.41	14.80	13.90
28	14.86	15.49	17.45	18.53	19.24	14.14	16.37	15.76	18.95	15.32	14.50	13.91
29	14.69	15.61	17.74	18.48	---	13.99	16.63	16.43	19.35	15.13	14.42	13.94
30	14.60	15.55	18.10	18.36	---	13.84	16.71	16.78	19.41	15.04	14.43	13.89
31	14.56	---	18.50	18.22	---	13.80	---	16.75	---	14.98	14.34	---
MEAN	14.74	15.27	16.75	18.61	17.81	16.85	14.56	15.77	18.04	16.60	14.18	13.91
MAX	15.12	15.74	18.50	19.04	19.24	19.55	16.71	16.78	19.41	19.27	14.87	14.29
MIN	13.91	14.64	15.30	17.97	16.67	13.80	13.79	15.15	16.50	14.98	13.68	13.80

WTR YR 1990 MEAN 16.08 MAX 19.55 MIN 13.68

06330110 MISSOURI RIVER STAGE GAGE NO. 9 AT WILLISTON, ND

LOCATION.--Lat 48°08'13", long 103°36'16", in NE$_{4}$NE$^{1}_{4}$ sec.25, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, on left bank levee at southeast edge of Williston 0.5 mi upstream from Little Muddy Creek, and at mile 1,546.2.

DRAINAGE AREA.--164,500 mi^2, approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,820.00 ft above National Geodetic Vertical Datum of 1929. Prior to May 13, 1969, at site 900 ft downstream. At datum 20.00 ft lower prior to Apr. 7, 1962.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 34.22 ft, July 25, 28, 1975; minimum daily recorded, 5.44 ft, Aug. 20, 1961, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.78	22.33	23.38	25.95	25.46	26.35	21.77	23.54	23.59	25.56	22.59	22.23
2	21.80	22.45	23.42	26.11	25.12	26.42	21.91	23.53	23.49	25.45	22.51	22.18
3	21.86	22.56	23.42	26.23	24.71	26.45	21.73	23.39	24.04	25.29	22.46	22.01
4	21.96	22.59	23.23	26.29	24.55	26.43	21.69	23.24	24.60	25.02	22.44	21.94
5	22.12	22.66	23.13	26.31	24.45	26.43	21.68	23.14	24.69	24.93	22.41	21.93
6	22.28	22.68	23.08	26.29	24.41	26.43	21.73	23.04	24.66	24.99	22.37	21.91
7	22.40	22.70	23.43	26.21	24.53	26.38	21.72	22.81	24.54	24.77	22.33	21.90
8	22.56	22.65	23.34	26.15	24.79	26.19	21.92	22.77	24.27	24.73	22.18	21.86
9	22.61	22.67	23.25	26.09	24.92	25.89	21.76	22.70	24.13	24.57	22.11	21.81
10	22.68	22.70	23.30	26.08	25.17	25.66	21.87	22.70	24.31	24.36	22.02	21.80
11	22.65	22.71	23.34	26.08	25.37	25.46	21.94	22.71	24.31	24.26	21.93	21.80
12	22.65	22.88	24.23	26.04	25.53	24.93	22.03	22.98	24.39	24.14	21.85	21.89
13	22.65	22.77	24.50	26.04	25.56	24.62	22.02	23.24	24.57	23.99	21.75	21.76
14	22.64	22.78	24.59	26.05	25.62	24.12	22.01	23.29	24.70	23.70	21.67	21.75
15	22.56	22.72	24.75	26.06	25.70	24.20	22.04	23.27	25.12	23.48	21.71	21.74
16	22.54	23.09	24.95	26.02	25.66	23.72	22.04	22.92	25.35	23.36	21.69	21.91
17	22.55	23.26	25.01	26.04	25.41	23.47	22.12	23.00	25.17	23.21	21.63	21.79
18	22.58	23.17	24.97	26.07	25.18	23.88	22.15	23.16	24.87	23.14	21.66	21.70
19	22.60	23.21	24.77	26.04	25.00	23.36	22.16	23.16	24.65	23.09	21.70	21.72
20	22.56	23.14	24.77	25.96	24.87	22.67	22.18	23.12	24.55	22.99	21.68	21.67
21	22.54	23.07	25.04	25.83	24.88	22.38	22.31	23.03	24.47	22.89	21.67	21.71
22	22.51	22.94	25.20	25.68	24.95	22.26	22.41	22.93	24.44	22.82	21.67	21.72
23	22.48	22.97	25.29	25.54	25.19	22.63	22.42	22.91	24.60	22.77	22.05	21.74
24	22.47	22.94	25.35	25.45	25.35	22.43	22.55	23.11	24.69	22.72	22.03	21.71
25	22.45	22.86	25.18	25.48	25.64	22.24	22.71	23.11	24.73	22.75	22.05	21.75
26	22.42	22.85	25.03	25.65	25.93	22.19	22.99	22.93	24.96	22.85	22.39	21.74
27	22.44	22.97	25.03	25.74	26.10	22.20	23.27	22.91	25.18	22.93	22.57	21.76
28	22.58	23.26	25.09	25.79	26.22	22.09	23.39	23.07	25.26	22.86	22.42	21.76
29	22.47	22.97	25.25	25.74	---	21.96	23.52	23.56	25.46	22.72	22.34	21.83
30	22.42	23.42	25.46	25.70	---	21.82	23.56	23.89	25.59	22.69	22.33	21.78
31	22.34	---	25.70	25.58	---	21.74	---	23.87	---	22.66	22.25	---
MEAN	22.42	22.87	24.40	25.94	25.22	24.10	22.25	23.13	24.65	23.73	22.08	21.83
MAX	22.68	23.42	25.70	26.31	26.22	26.45	23.56	23.89	25.59	25.56	22.59	22.23
MIN	21.78	22.33	23.08	25.45	24.41	21.74	21.68	22.70	23.49	22.66	21.63	21.67

WTR YR 1990 MEAN 23.55 MAX 26.45 MIN 21.63

06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND

LOCATION.--Lat 48°17'04", long 103°34'21", in NE¼NW¼ sec.5, T.155 N., R.100 W., Williams County, Hydrologic Unit 10110102, on left bank 37 ft downstream from centerline of highway, 1 mi downstream from Cow Creek, 4 mi upstream from Camp Creek, 10 mi northeast of Williston, and 13 mi upstream from mouth.

DRAINAGE AREA.--875 mi², approximately, of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1954 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Datum of gage is 1,863.18 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 5. Records good except those for period of estimated daily discharges, which are poor. Some small diversions for irrigation. Some regulation by Lake Zahl, Fish and Wildlife Service reservoir 22 mi upstream and Blacktail Dam about 15 mi upstream.

AVERAGE DISCHARGE.--29 years (water years 1955-1983), 38.8 ft³/s, 28,110 acre-ft/yr; median of yearly mean discharges, 31 ft³/s, 22,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,180 ft³/s, Apr. 18, 1979, gage height, 12.77 ft; maximum gage height, 13.57 ft, Mar. 27, 1960; minimum discharge, 0.20 ft³/s, Nov. 27, 1960, Feb. 5, 1963, and June 4, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 70 ft³/s, Mar. 18, gage height, 5.77 ft; minimum daily discharge, 1.8 ft³/s, Sept. 15-16, but may have been less during period of nonoperation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e5.4	e7.7	13	11	8.2	4.7	3.2	3.2
2	---	---	---	---	e5.3	e9.3	13	11	7.9	5.2	3.0	2.9
3	---	---	---	---	e5.4	e12	13	10	7.9	6.3	2.9	2.9
4	---	---	---	---	e5.5	e16	12	9.7	8.1	5.6	2.8	2.8
5	---	---	---	---	e5.7	e18	12	9.4	7.5	5.2	2.8	2.8
6	---	---	---	---	e6.0	17	12	9.5	6.8	5.2	2.7	2.8
7	---	---	---	---	e6.2	17	11	9.8	7.0	5.0	2.5	2.5
8	---	---	---	---	e6.0	20	11	9.1	7.9	4.6	2.4	2.4
9	---	---	---	---	e5.9	20	11	8.8	6.9	4.4	2.3	2.4
10	---	---	---	---	e6.3	20	11	8.5	6.4	4.6	2.3	2.5
11	---	---	---	---	e6.8	22	10	8.4	6.4	4.5	2.1	2.5
12	---	---	---	---	e7.0	24	10	8.2	5.9	4.0	2.5	2.1
13	---	---	---	---	e6.6	20	10	8.5	5.2	3.5	2.5	1.9
14	---	---	---	---	e6.3	17	10	8.4	4.9	3.1	2.5	1.9
15	---	---	---	---	e6.0	15	9.6	8.3	5.6	2.8	2.5	1.8
16	---	---	---	---	e5.8	11	10	9.4	5.9	3.2	2.4	1.8
17	---	---	---	---	e5.5	11	9.6	8.9	6.8	4.1	2.2	2.0
18	---	---	---	---	e5.2	22	9.4	9.3	6.7	3.6	2.7	2.4
19	---	---	---	---	e5.0	17	9.3	9.2	6.4	3.4	4.1	2.5
20	---	---	---	---	e5.0	17	9.3	9.8	5.7	3.2	5.9	3.1
21	---	---	---	---	e5.2	17	9.1	10	5.2	3.3	5.3	3.0
22	---	---	---	---	e5.5	14	9.3	8.8	4.8	3.6	5.2	2.9
23	---	---	---	---	e6.3	13	8.7	8.1	4.5	3.7	4.7	2.8
24	---	---	---	---	e6.1	13	8.4	7.3	4.5	3.6	4.8	2.8
25	---	---	---	---	e6.4	12	10	9.7	4.7	3.2	4.9	2.9
26	---	---	---	---	e6.5	12	11	13	4.5	3.6	5.2	2.7
27	---	---	---	---	e6.6	12	11	13	5.0	4.4	5.3	2.1
28	---	---	---	---	e7.0	13	11	12	4.8	3.7	4.3	2.2
29	---	---	---	---	---	13	11	11	4.7	3.3	3.7	2.5
30	---	---	---	---	---	13	11	10	4.6	3.3	3.4	3.0
31	---	---	---	---	---	13	---	9.0	---	3.3	3.5	---
TOTAL	---	---	---	---	166.5	478.0	316.7	297.1	181.4	125.2	106.6	76.1
MEAN	---	---	---	---	5.95	15.4	10.6	9.58	6.05	4.04	3.44	2.54
MAX	---	---	---	---	7.0	24	13	13	8.2	6.3	5.9	3.2
MIN	---	---	---	---	5.0	7.7	8.4	7.3	4.5	2.8	2.1	1.8
AC-FT	---	---	---	---	330	948	628	589	360	248	211	151

e Estimated

06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	1430	3.4	2260	--	12.5	8.0	--	--	--	--	--	--
FEB												
15...	1125	6.0	2600	--	-11.5	1.0	--	--	--	--	--	--
MAR												
06...	1400	17	1830	--	7.0	1.5	--	--	--	--	--	--
28...	0920	13	1610	8.2	0.5	4.0	350	62	47	260	61	6
MAY												
01...	1330	11	2060	--	8.5	7.0	--	--	--	--	--	--
JUN												
07...	0740	6.5	2200	--	15.0	16.0	--	--	--	--	--	--
28...	0745	4.9	2240	8.4	21.5	22.5	400	48	68	410	68	9
AUG												
08...	1115	2.4	2360	--	32.5	22.0	--	--	--	--	--	--
SEP												
06...	0805	2.7	1650	--	16.5	18.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
28...	6.8	580	0	480	430	7.7	0.30	11	1120	1110	1.52
JUN											
28...	9.2	690	19	599	680	11	0.40	5.7	1600	1590	2.18

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
28...	38.4	4	240	40	<1	55	60	0.1	<1	1	670
JUN											
28...	21.3	4	320	30	<1	87	10	<0.1	<1	1	730

06332515 BEAR DEN CREEK NEAR MANDAREE, ND
(Hydrologic bench-mark station)
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 47°47'14", long 102°46'05", in NW¼ sec.30, T.150 N., R.94 W., McKenzie County, Hydrologic Unit 10110101, on right bank 0.5 mi upstream from county highway culvert, and 5.5 mi northwest of Mandaree.

DRAINAGE AREA.--74 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,947.58 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 15 to Apr. 6. Records fair.

AVERAGE DISCHARGE.--24 years, 7.21 ft³/s, 5,220 acre-ft/yr; median of yearly mean discharges, 6.7 ft³/s, 4,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,840 ft³/s, Mar. 13, 1972, gage height, 9.02 ft; maximum gage height, 10.03 ft, Apr. 6, 1969; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Feb. 20	1345	ice jam	[a]*5.74	July 3	0900	*190	5.41

No flow for many days.
a - Backwater from ice

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	.21	e.19	e.00	e.00	e1.0	e1.0	.26	.28	.89	.20	.08
2	.14	.20	e.17	e.00	e.00	e.85	e1.1	.26	.33	1.8	.17	.09
3	.14	.22	e.18	e.00	e.00	e.90	e1.3	.21	.28	87	.18	.10
4	.16	.23	e.20	e.00	e.00	e.80	e1.1	.24	.23	11	.17	.08
5	.18	.24	e.19	e.00	e.00	e.75	e.95	.29	.20	1.9	.16	.08
6	.17	.26	e.18	e.00	e.00	e.80	e.84	.30	.16	.80	.14	.07
7	.17	.26	e.16	e.00	e.00	e.95	.64	.28	.20	.89	.12	.07
8	.16	.25	e.16	e.00	e.00	e1.2	.51	.25	.28	.53	.10	.06
9	.16	.23	e.15	e.00	e.00	e1.5	.46	.25	.20	.34	.09	.06
10	.15	.25	e.13	e.00	e.00	e2.1	.42	.25	.18	.23	.08	.07
11	.16	.25	e.12	e.00	e.00	e3.5	.33	.28	.23	.20	.08	.07
12	.16	.25	e.10	e.00	e.00	e3.0	.30	.26	.21	.18	.09	.06
13	.17	.24	e.09	e.00	e.00	e2.3	.26	.26	.19	.16	.10	.06
14	.18	.23	e.07	e.00	e.00	e1.8	.24	.24	.17	.14	.09	.06
15	.16	e.20	e.05	e.00	e.00	e1.5	.23	.26	.20	.13	.09	.07
16	.16	e.18	e.03	e.00	e.00	e1.8	.24	.28	.28	.17	.08	.08
17	.15	e.16	e.01	e.00	e.00	e2.0	.23	.26	4.5	.14	.08	.11
18	.15	e.17	e.00	e.00	e.00	e1.7	.29	.25	3.1	.14	.09	.14
19	.16	e.21	e.00	e.00	e.00	e1.6	.24	.24	2.6	.19	.10	.13
20	.16	e.22	e.00	e.00	e.00	e1.8	.22	.24	1.2	.20	.11	.12
21	.17	e.21	e.00	e.00	e.00	e1.5	.22	.23	.56	.17	.10	.11
22	.17	e.19	e.00	e.00	e.05	e1.1	.24	.22	.33	.15	.12	.11
23	.22	e.17	e.00	e.00	e.20	e.80	.21	.22	.24	.14	.10	.10
24	.21	e.18	e.00	e.00	e.10	e.65	.22	.21	.21	.16	.09	.10
25	.20	e.20	e.00	e.00	e.30	e.60	.64	.62	.18	.15	.08	.09
26	.29	e.20	e.00	e.00	e.50	e.65	.48	2.7	.17	.89	.10	.09
27	1.5	e.19	e.00	e.00	e.65	e.75	.33	1.7	.16	2.2	.13	.11
28	.50	e.18	e.00	e.00	e.80	e.85	.28	.75	.38	.64	.11	.13
29	.37	e.19	e.00	e.00	---	e1.0	.29	.48	.36	.48	.09	.12
30	.25	e.20	e.00	e.00	---	e1.2	.28	.39	.46	.33	.08	.11
31	.22	---	e.00	e.00	---	e1.1	---	.36	---	.24	.08	---
TOTAL	7.30	6.37	2.18	0.00	2.60	42.05	14.09	13.04	18.07	112.58	3.40	2.73
MEAN	.24	.21	.070	.000	.093	1.36	.47	.42	.60	3.63	.11	.091
MAX	1.5	.26	.20	.00	.80	3.5	1.3	2.7	4.5	87	.20	.14
MIN	.14	.16	.00	.00	.00	.60	.21	.21	.16	.13	.08	.06
AC-FT	14	13	4.3	.00	5.2	83	28	26	36	223	6.7	5.4

CAL YR 1989 TOTAL 823.65 MEAN 2.26 MAX 100 MIN .00 AC-FT 1630
WTR YR 1990 TOTAL 224.41 MEAN .61 MAX 87 MIN .00 AC-FT 445

e Estimated

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

REMARKS.--Additional radiation and radionuclide data were not available at printing. These data will be available from files at the Bismarck District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT												
02...	1235	0.13	3000	--	4.5	8.0	--	--	--	--	--	--
25...	1130	0.20	2860	8.6	17.0	8.0	39	10.5	98	140	K33	170
NOV												
30...	1235	0.21	3070	8.3	4.5	1.0	9.4	12.8	98	--	--	240
FEB												
27...	1215	0.65	2670	--	0.5	0.5	--	--	--	--	--	--
MAR												
05...	1315	0.74	2780	8.3	4.5	1.0	8.0	13.0	100	100	20	220
14...	1025	1.8	2400	--	0.5	0.5	--	--	--	--	--	--
29...	1140	0.99	2170	8.3	2.5	1.5	--	12.7	99	--	--	--
APR												
17...	0915	0.23	2530	8.4	6.0	4.0	25	12.0	99	148	K76	200
MAY												
03...	0840	0.24	2650	--	10.5	10.0	--	--	--	--	--	--
JUN												
18...	1040	2.9	3500	8.5	26.0	20.5	140	7.5	92	--	--	250
JUL												
03...	1115	134	1000	--	24.5	23.0	--	--	--	--	--	--
AUG												
02...	0745	0.17	1240	8.3	18.0	19.0	150	6.4	75	470	310	100
27...	1345	0.13	2310	8.3	26.0	23.0	--	8.1	--	--	--	170
SEP												
04...	1240	0.08	2760	--	24.0	20.0	--	--	--	--	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT												
25...	27	26	650	89	21	6.2	863	810	915	36	760	2.3
NOV												
30...	48	29	680	86	19	6.7	946	893	1090	0	840	2.5
MAR												
05...	40	29	610	86	18	4.2	752	770	940	0	710	8.1
29...	--	--	--	--	--	--	--	580	708	0	--	--
APR												
17...	36	26	520	85	16	5.7	714	690	744	48	540	3.7
JUN												
18...	44	35	820	87	22	11	635	620	683	36	1200	10
AUG												
02...	26	9.5	240	82	10	7.3	328	306	349	12	310	4.3
27...	27	25	550	87	18	4.8	771	--	--	--	630	4.3

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
OCT												
25...	0.40	7.0	1960	1970	2.67	1.06	<0.010	<0.100	0.050	0.030	0.70	0.060
NOV												
30...	0.40	15	2150	2160	2.92	1.22	<0.010	<0.100	0.020	0.020	0.50	0.020
MAR												
05...	0.20	17	1960	1880	2.67	3.92	<0.010	<0.100	0.060	0.040	0.40	0.010
APR												
17...	0.40	10	1740	1560	2.37	1.08	<0.010	<0.100	0.060	0.030	0.90	0.060
JUN												
18...	0.20	4.6	2530	2500	3.44	19.6	<0.010	<0.100	0.020	0.030	0.30	0.210
AUG												
02...	<0.10	7.3	792	789	1.08	0.36	0.020	<0.100	0.070	0.020	1.2	0.180
27...	0.20	12	--	1720	2.33	0.63	--	<0.100	--	--	--	--

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT 25...	<0.010	<0.010	80	1	<100	<10	<1.0	<1	<1	1	80
NOV 30...	<0.010	<0.010	--	--	--	--	--	--	--	--	--
MAR 05...	<0.010	<0.010	10	1	<100	<10	<1.0	<1	1	1	50
APR 17...	<0.010	<0.010	60	2	<100	<10	<1.0	1	1	2	100
JUN 18...	0.020	<0.010	--	--	--	--	--	--	--	--	--
AUG 02...	<0.010	<0.010	20	1	50	<0.5	1.0	1	<3	4	25
27...	--	0.020	--	--	--	--	--	--	--	--	40

DATE	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
OCT 25...	<1	80	30	0.1	3	3	<1	<1.0	300	6	<10
MAR 05...	<1	70	120	0.1	1	1	<1	<1.0	380	3	<10
APR 17...	<1	60	110	<0.1	1	4	<1	<1.0	430	2	<10
AUG 02...	1	24	24	<0.1	<10	6	1	<1.0	260	<6	5
27...	--	--	<10	--	--	--	--	--	--	--	--

DATE	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 25...	1.6	1.5	5.4	2.8	4.9	2.2	0.14	1.9	132	0.07	68
NOV 30...	--	--	--	--	--	--	--	--	119	0.07	50
MAR 05...	--	--	--	--	--	--	--	--	98	0.20	34
APR 17...	--	--	--	--	--	--	--	--	147	0.09	83
JUN 18...	--	--	--	--	--	--	--	--	352	2.7	81
AUG 02...	--	--	--	--	--	--	--	--	109	0.05	90

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT								
25...	1130	0.0	0.40	2860	8.6	8.0	10.5	98
25...	1132	0.39	0.60	2860	8.6	8.0	10.5	96
25...	1134	0.40	0.80	2860	8.6	8.0	10.5	96
25...	1136	0.41	1.00	2860	8.6	8.0	10.5	96
25...	1138	0.40	1.20	2860	8.6	8.0	10.5	96
25...	1140	0.32	1.40	2860	8.6	8.0	10.5	96
MAR								
05...	1320	0.30	0.70	2780	8.3	1.0	13.0	98
05...	1322	0.36	1.00	2780	8.3	1.0	13.0	98
05...	1324	0.35	1.30	2780	8.3	1.0	13.0	98
05...	1326	0.30	1.60	2780	8.3	1.0	13.0	98
05...	1328	0.22	1.90	2780	8.3	1.0	13.0	98
APR								
17...	0917	0.40	0.70	2530	8.4	4.0	12.0	98
17...	0919	0.40	0.90	2530	8.4	4.0	12.0	98
17...	0921	0.40	1.10	2530	8.4	4.0	12.0	98
17...	0923	0.38	1.30	2530	8.4	4.0	12.0	98
AUG								
02...	0749	0.42	0.60	1240	8.3	19.0	6.4	73
02...	0751	0.40	0.80	1240	8.3	19.0	6.4	73
02...	0753	0.40	1.00	1240	8.3	19.0	6.4	73
02...	0755	0.30	1.20	1240	8.3	19.0	6.4	73

06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND

LOCATION.--Lat 46°17'44", long 103°55'06", in SW¼ sec.30, T.133 N., R.105 W., Slope County, Hydrologic Unit 10110203, on left bank 90 ft downstream from bridge on U.S. Highway 12 in Marmarth, and 1.5 mi downstream from Little Beaver Creek.

DRAINAGE AREA.--4,640 mi², approximately.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 2,686.32 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Nov. 12 to Mar. 10, May 8-12, June 16-18, July 10-13, and July 20-22. Records good except those for periods of estimated daily discharges, which are poor. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--52 years, 315 ft³/s, 228,200 acre-ft/yr; median of yearly mean discharges, 256 ft³/s, 185,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,000 ft³/s, 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.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
July 25	0530	*9,810	*10.74	No other peak greater than base discharge.			

Minimum daily discharge, 0.01 ft³/s, Sept. 27-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	42	e7.5	e1.5	e2.0	e575	87	43	358	8.7	13	4.0
2	3.7	39	e7.0	e1.6	e1.5	e1450	82	134	277	6.0	8.7	2.5
3	4.1	33	e6.5	e1.5	e2.0	e975	77	681	207	3.5	6.3	1.6
4	4.5	36	e7.0	e1.5	e2.5	e1290	75	814	170	2.6	4.5	.95
5	4.3	57	e7.5	e1.5	e3.5	e1220	72	820	141	2.0	3.3	1.2
6	4.7	72	e7.0	e2.0	e3.0	e1190	73	743	118	1.6	2.3	.85
7	5.2	68	e6.5	e2.0	e3.5	e900	65	644	103	1.2	1.7	.54
8	5.3	47	e6.0	e2.0	e3.0	e700	56	e563	86	1.1	1.1	.39
9	6.8	40	e6.5	e2.5	e3.0	e600	51	e367	78	.92	.87	.28
10	6.7	34	e6.0	e2.5	e3.0	e700	51	e234	72	e1.6	.89	.23
11	5.9	27	e5.0	e3.5	e20	717	44	e174	64	e28	.84	.17
12	5.9	e23	e5.0	e3.0	e35	471	49	e194	58	e104	.60	.11
13	6.7	e15	e5.5	e2.5	e50	375	47	209	50	e61	.46	.06
14	6.1	e11	e5.0	e3.0	e60	312	41	168	44	28	.41	.06
15	7.3	e9.0	e4.0	e3.5	e55	258	38	139	48	19	.25	.04
16	6.9	e8.5	e3.0	e3.0	e50	241	35	115	e63	12	.14	.04
17	6.6	e8.3	e2.2	e2.5	e45	275	35	104	e318	7.3	441	.03
18	6.7	e8.5	e1.8	e2.0	e40	227	34	96	e272	4.3	330	.02
19	7.1	e12	e1.4	e2.5	e35	221	32	85	131	3.0	37	.03
20	7.4	e8.0	e1.0	e2.0	e35	207	30	79	88	e60	17	.04
21	7.4	e7.5	e1.1	e2.5	e30	192	28	74	72	e63	9.2	.03
22	7.4	e7.0	e1.1	e3.0	e45	156	26	68	57	e19	5.2	.03
23	8.5	e6.0	e1.2	e3.5	e130	94	25	64	46	9.2	2.8	.03
24	9.1	e6.5	e1.3	e3.0	e380	265	26	68	39	9.5	1.8	.02
25	8.8	e7.0	e1.7	e2.5	e350	151	31	65	32	4440	1.2	.02
26	10	e7.0	e1.7	e3.0	e450	130	29	71	28	248	.79	.02
27	15	e6.5	e1.7	e3.5	e350	210	29	871	22	80	1.5	.01
28	21	e6.0	e1.9	e3.0	e300	145	28	1270	24	48	38	.01
29	55	e6.5	e1.8	e3.5	---	111	28	1020	17	33	19	.01
30	45	e7.0	e1.5	e3.5	---	103	35	681	14	26	12	.01
31	50	---	e1.6	e3.0	---	94	---	469	---	18	7.0	---
TOTAL	352.6	665.3	118.0	80.1	2487.0	14555	1359	11127	3097	5349.52	968.85	13.33
MEAN	11.4	22.2	3.81	2.58	88.8	470	45.3	359	103	173	31.3	.44
MAX	55	72	7.5	3.5	450	1450	87	1270	358	4440	441	4.0
MIN	3.5	6.0	1.0	1.5	1.5	94	25	43	14	.92	.14	.01
AC-FT	699	1320	234	159	4930	28870	2700	22070	6140	10610	1920	26

CAL YR 1989 TOTAL 37856.70 MEAN 104 MAX 2310 MIN .00 AC-FT 75090
WTR YR 1990 TOTAL 40172.70 MEAN 110 MAX 4440 MIN .01 AC-FT 79680

e Estimated

06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
04...	1105	4.5	2450	--	10.5	6.5	--	--	--	--	--	--
NOV												
15...	1245	8.8	1760	--	-11.0	0.5	--	--	--	--	--	--
JAN												
04...	1315	1.5	3350	--	0.0	0.5	--	--	--	--	--	--
FEB												
14...	1445	60	560	--	-7.0	0.0	--	--	--	--	--	--
MAR												
06...	1505	1190	387	8.0	0.0	0.5	86	22	7.5	43	50	2
21...	1135	194	789	--	9.0	5.5	--	--	--	--	--	--
APR												
04...	1145	75	1120	--	12.0	10.5	--	--	--	--	--	--
MAY												
17...	1115	102	1100	--	18.0	11.5	--	--	--	--	--	--
JUN												
27...	1150	23	1650	--	33.5	29.0	--	--	--	--	--	--
AUG												
09...	1050	--	1560	8.7	24.0	24.0	200	46	20	290	75	9

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
06...	5.2	120	0	98	96	4.7	0.20	14	249	252	0.34
AUG											
09...	12	360	0	294	520	12	0.40	11	1050	1090	1.43

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
06...	800	3	90	10	<1	21	<10	<0.1	2	<1	270
AUG											
09...	--	2	300	10	<1	94	10	<0.1	4	1	540

06336600 BEAVER CREEK NEAR TROTTERS, ND

LOCATION.--Lat 47°09'47", long 103°59'32", in SW¼SW¼NE¼ sec.33, T.143 N., R.105 W., Golden Valley County, Hydrologic Unit 10110204, on left bank 100 ft upstream from bridge on county road, 2.4 mi east of Montana-North Dakota State line, 13 mi southwest of Trotters, 17 mi north of Beach, 20 mi upstream from Elk Creek, and 27 mi above mouth.

DRAINAGE AREA.--616 mi², revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year (seasonal records only since 1984).

REVISED RECORDS.--1977: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,370 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 26. Records fair.

AVERAGE DISCHARGE.--6 years (water years 1978-83), 33.3 ft³/s, 24,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s, Mar. 29, 1978, gage height, 18.61 ft; maximum gage height, 19.27 ft, Mar. 22, 1978, ice jam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 152 ft³/s, June 28, gage height, 5.63 ft; maximum gage height, 6.18 ft., Mar. 4, backwater from ice; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e.00	e8.0	7.5	2.7	1.2	1.2	.00	.00
2	---	---	---	---	e.00	e40	6.5	2.9	1.1	.60	.00	.00
3	---	---	---	---	e.00	e80	6.4	2.6	1.2	.38	.00	.00
4	---	---	---	---	e.00	e60	6.2	2.8	1.5	.21	.00	.00
5	---	---	---	---	e.00	e50	5.7	2.6	1.1	.14	.00	.00
6	---	---	---	---	e.00	e45	5.3	2.6	.87	.11	.00	.00
7	---	---	---	---	e.00	e55	5.1	2.2	.71	.10	.00	.00
8	---	---	---	---	e.00	e40	5.0	1.8	.66	.06	.00	.00
9	---	---	---	---	e.00	e25	4.9	2.0	.59	.04	.00	.00
10	---	---	---	---	e.00	e20	4.8	1.9	.70	.05	.00	.00
11	---	---	---	---	e.00	e16	5.0	1.7	.53	.58	.00	.00
12	---	---	---	---	e.00	e14	4.6	1.6	.68	.19	.00	.00
13	---	---	---	---	e.00	e11	4.5	1.6	.46	.05	.00	.00
14	---	---	---	---	e.00	e12	4.2	1.4	.31	.00	.00	.00
15	---	---	---	---	e.00	e11	4.0	1.6	.78	.00	.00	.00
16	---	---	---	---	e.00	e13	3.7	1.6	.80	.00	.00	.00
17	---	---	---	---	e.00	e18	3.5	1.8	2.1	.00	.00	.00
18	---	---	---	---	e.00	e16	3.4	1.7	2.3	.00	.00	.00
19	---	---	---	---	e.00	e14	3.3	1.7	4.2	.00	.00	.00
20	---	---	---	---	e.00	e15	3.1	1.6	1.4	.00	.00	.00
21	---	---	---	---	e.15	e13	2.9	1.8	.88	.00	.00	.00
22	---	---	---	---	e.60	e13	2.5	1.6	.73	.00	.00	.00
23	---	---	---	---	e4.0	e14	2.6	1.7	.41	.00	.00	.00
24	---	---	---	---	e3.0	e11	2.8	1.8	.30	.00	.00	.00
25	---	---	---	---	e3.5	e11	3.5	2.0	.10	.00	.00	.00
26	---	---	---	---	e4.5	e11	3.7	1.9	.19	.00	.00	.00
27	---	---	---	---	e5.5	12	3.5	2.3	.08	.00	.00	.00
28	---	---	---	---	e6.5	11	3.4	2.1	55	.00	.00	.00
29	---	---	---	---	---	9.2	3.1	1.9	8.1	.00	.00	.00
30	---	---	---	---	---	8.1	2.7	1.4	3.1	.00	.00	.00
31	---	---	---	---	---	7.7	---	1.3	---	.00	.00	---
TOTAL	---	---	---	---	27.75	684.0	127.4	60.2	92.08	3.71	0.00	0.00
MEAN	---	---	---	---	.99	22.1	4.25	1.94	3.07	.12	.000	.000
MAX	---	---	---	---	6.5	80	7.5	2.9	55	1.2	.00	.00
MIN	---	---	---	---	.00	7.7	2.5	1.3	.08	.00	.00	.00
AC-FT	---	---	---	---	55	1360	253	119	183	7.4	.00	.00

e Estimated

LITTLE MISSOURI RIVER BASIN

06336600 BEAVER CREEK NEAR TROTTERS, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
FEB												
28...	1155	6.6	2440	--	10.0	0.5	--	--	--	--	--	--
MAR												
14...	1315	11	1030	--	1.0	0.5	--	--	--	--	--	--
28...	1325	13	1550	8.3	3.0	0.5	400	72	54	210	52	5
APR												
16...	1005	4.1	2110	--	2.5	8.5	--	--	--	--	--	--
MAY												
04...	1005	2.9	2230	--	17.0	13.0	--	--	--	--	--	--
JUN												
04...	1330	1.5	2380	--	23.5	20.0	--	--	--	--	--	--
28...	1200	52	470	--	27.5	19.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
28...	9.2	330	0	270	590	8.4	0.20	2.7	1120	1110	1.52

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
28...	39.0	3	340	20	<1	33	20	0.1	<1	<1	880

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND

LOCATION.--Lat 47°35'25", long 103°15'05", in NW¼SE¼SE¼ sec.35, T.148 N., R.99 W., McKenzie County, Hydrologic Unit 10110205, at bridge on U.S. Highway 85, 17 mi upstream from Cherry Creek, and 17.5 mi south of Watford City.

DRAINAGE AREA.--8,310 mi² approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1934 to current year.

REVISED RECORDS (WATER YEARS).--WSP 926: 1935. WSP 1270: 1943.

GAGE.--Water-stage recorder and supplemental nonrecording gage. Datum of gage is 1,929.03 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Nov. 13 to Mar. 6 and Mar. 22-26. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--56 years, 559 ft³/s, 405,000 acre-ft/yr; median of yearly mean discharges, 450 ft³/s, 326,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 110,000 ft³/s, Mar. 25, 1947, gage height, 24.0 ft from floodmark, site then in use; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage Height (ft)	Date	Time	Discharge (ft³/s)	Gage Height (ft)
Mar. 5	0800	[a]*6,000	[b]*6.81				

No flow for many days.
a - About
b - Backwater from ice

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	119	e16	e.00	e.00	e120	245	71	170	477	271	21
2	3.8	95	e14	e.00	e.00	e800	263	67	780	495	200	16
3	3.8	77	e15	e.00	e.00	e1700	228	65	820	622	137	11
4	3.9	89	e17	e.00	e.00	e1450	200	62	550	300	90	9.7
5	4.2	104	e18	e.00	e.00	e3000	184	59	410	230	70	7.8
6	4.2	92	e16	e.00	e.00	e2200	172	58	354	153	61	6.8
7	4.0	95	e13	e.00	e.00	1970	161	61	319	132	54	6.3
8	3.8	98	e12	e.00	e.00	1850	150	73	276	116	47	5.8
9	3.5	92	e10	e.00	e.00	1650	136	446	239	114	39	5.5
10	3.3	80	e8.5	e.00	e.00	1470	132	595	212	338	34	5.2
11	3.2	72	e7.5	e.00	e.00	1290	128	544	192	241	31	4.5
12	3.1	80	e6.0	e.00	e.00	1100	125	471	169	334	29	3.5
13	3.0	e95	e5.0	e.00	e.00	947	121	441	140	414	25	3.0
14	2.8	e85	e3.5	e.00	e.00	840	115	418	126	224	20	2.6
15	2.8	e70	e2.8	e.00	e.00	821	106	350	124	153	16	3.1
16	2.9	e56	e2.0	e.00	e.00	682	103	319	127	116	18	2.8
17	2.8	e45	e1.5	e.00	e.00	544	100	280	303	92	19	2.3
18	2.7	e40	e1.0	e.00	e.00	513	96	265	965	77	33	2.0
19	2.6	e45	e.50	e.00	e.00	441	93	225	681	73	29	2.2
20	2.6	e50	e.00	e.00	e.00	441	86	175	507	70	20	1.8
21	2.8	e46	e.00	e.00	e.00	471	81	170	418	71	14	2.0
22	3.1	e38	e.00	e.00	e.00	e420	77	152	414	76	12	2.4
23	3.2	e28	e.00	e.00	e.00	e340	70	132	370	67	65	2.3
24	3.0	e18	e.00	e.00	e.00	e280	66	115	285	61	114	2.0
25	2.8	e20	e.00	e.00	e.00	e400	126	370	205	55	92	1.8
26	9.1	e18	e.00	e.00	e.00	e550	122	320	197	84	73	1.5
27	1040	e15	e.00	e.00	e.30	390	104	240	162	76	62	1.3
28	1030	e12	e.00	e.00	e1.0	319	95	185	530	496	48	1.5
29	445	e13	e.00	e.00	---	277	92	125	1380	1160	36	1.6
30	237	e14	e.00	e.00	---	262	78	115	785	690	25	1.4
31	168	---	e.00	e.00	---	260	---	105	---	362	22	---
TOTAL	3010.8	1801	169.30	0.00	1.30	27798	3855	7074	12210	7969	1806	140.7
MEAN	97.1	60.0	5.46	.000	.046	897	128	228	407	257	58.3	4.69
MAX	1040	119	18	.00	1.0	3000	263	595	1380	1160	271	21
MIN	2.6	12	.00	.00	.00	120	66	58	124	55	12	1.3
AC-FT	5970	3570	336	.00	2.6	55140	7650	14030	24220	15810	3580	279

CAL YR 1989 TOTAL 75727.30 MEAN 207 MAX 4450 MIN .00 AC-FT 150200
WTR YR 1990 TOTAL 65835.10 MEAN 180 MAX 3000 MIN .00 AC-FT 130600

e Estimated

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
03...	1050	3.8	2500	--	7.5	5.5	--	--	--	--	--
25...	0925	2.8	2500	8.6	9.5	8.0	10	11.0	102	K20	K3
DEC											
04...	1130	17	2720	--	8.0	0.5	--	--	--	--	--
MAR											
20...	1140	441	820	--	11.5	4.5	--	--	--	--	--
APR											
17...	1220	98	1630	8.5	11.0	9.0	2.0	11.0	103	K72	K50
JUN											
06...	1210	354	750	--	25.5	17.0	--	--	--	--	--
26...	1000	207	1230	8.5	27.0	23.5	4500	7.9	101	--	--
AUG											
01...	1150	275	682	7.9	27.0	22.5	3200	8.0	101	1400	700
SEP											
10...	1355	5.3	2000	--	30.5	24.0	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT										
25...	360	66	46	460	73	11	12	417	420	491
APR										
17...	270	62	27	270	68	7	9.1	315	302	332
JUN										
26...	78	20	6.8	220	84	11	7.9	213	200	220
AUG										
01...	65	15	6.7	110	77	6	6.5	126	98	120

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
OCT											
25...	11	960	12	0.30	7.9	1790	1820	2.43	13.6	--	<0.010
APR											
17...	18	560	7.4	0.30	7.8	1140	1130	1.55	302	--	<0.010
JUN											
26...	12	360	6.3	0.40	12	794	761	1.08	444	--	<0.010
AUG											
01...	0	180	4.1	0.60	9.1	398	396	0.54	296	0.990	0.010

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
OCT										
25...	<0.100	0.040	0.020	0.60	0.030	<0.010	<0.010	<10	<1	<100
APR										
17...	<0.100	0.070	0.020	0.70	0.080	0.010	<0.010	50	1	43
JUN										
26...	1.60	0.020	0.020	8.6	3.30	0.070	0.040	40	3	31
AUG										
01...	1.00	0.030	0.030	7.1	2.00	0.040	0.040	<10	1	24

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT										
25...	<10	<1.0	<1	2	2	10	<1	70	<10	<0.1
APR										
17...	<0.5	<1.0	<1	<3	3	32	1	51	5	<0.1
JUN										
26...	<0.5	<1.0	<1	<3	11	31	1	37	1	<0.1
AUG										
01...	<0.5	<1.0	1	<3	7	11	2	36	2	<0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
25...	4	4	<1	<1.0	800	6	<10	152	1.2	89
APR										
17...	20	3	<1	<1.0	570	<6	7	210	56	97
JUN										
26...	<10	8	4	<1.0	210	<6	10	13200	7380	100
AUG										
01...	<10	5	2	<1.0	200	<6	4	7900	5870	100

06338000 LAKE SAKAKAWEA NEAR RIVERDALE, ND

LOCATION.--Lat 47°30'10", long 101°25'50", in S½ sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10110101, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi², approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1966, published as Garrison Reservoir near Riverdale.

REVISED RECORDS.--WSP 1559: 1957(M).

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth-fill dam; storage began in November 1953. Maximum capacity, 24,200,000 acre-ft below elevation, 1,854.0 ft, top of 29-ft gates. Normal maximum, 22,700,000 acre-ft below elevation, 1,850.0 ft, of which about 4,300,000 acre-ft is designated for flood control. Elevation of crest of spillway, 1,825.0 ft, surmounted by radial gates. Inactive storage, 5,000,000 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.--Elevations and contents are furnished by the U.S. Army Corps of Engineers. Elevations are observed elevations at midnight on the last day of each month. Contents are computed based on reservoir inflow, reservoir outflow, evaporation, and rainfall; and are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 24,368,000 acre-ft, July 25, 1975, elevation, 1,854.6 ft; minimum since first reaching normal maximum level in July of 1969, 13,140,000 acre-ft, Apr. 24, 1990, adjusted for wind effect; minimum elevation, 1,819.1 ft, Apr. 26, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 14,278,000 acre-ft, Nov. 8, elevation, 1,824.5 ft, Nov. 7; minimum contents, 13,136,000 acre-ft, Apr. 24, adjusted for wind effect; minimum elevation, 1,819.1 ft, Apr. 26.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,823.0	14,100,000	--
Oct. 31	1,823.8	14,276,000	+176,000
Nov. 30	1,823.2	14,135,000	-141,000
Dec. 31	1,821.1	13,623,000	-512,000
CAL YR 1989	--	--	-534,000
Jan. 31	1,819.8	13,295,000	-328,000
Feb. 28	1,819.2	13,140,000	-155,000
Mar. 31	1,820.3	13,413,000	+273,000
Apr. 30	1,819.2	13,185,000	-228,000
May 31	1,819.4	13,179,000	-6,000
June 30	1,821.9	13,838,000	+659,000
July 31	1,822.8	14,092,000	+254,000
Aug. 31	1,821.1	13,641,000	-451,000
Sept. 30	1,821.0	13,614,000	-27,000
WTR YR 1990	--	--	-486,000

06338490 MISSOURI RIVER AT GARRISON DAM, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°30'08", long 101°25'50", in S sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10130101, downstream from dam at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Flow meter and gate readings.

REMARKS.--Records good. Many diversions above station. Flow regulated by Lake Sakakawea (station 06338000). Prior to October 1969 records were obtained at a site 9.1 mi downstream. Discharges at the downstream site were generally about 7 percent greater than those furnished by the U.S. Army Corps of Engineers for the present site.

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--21 years, 23,300 ft^3/s, 16,880,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 65,200 ft^3/s, July 25, 1975; minimum daily, 6,000 ft^3/s, Sept. 29, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25,600 ft^3/s, Jan. 28; minimum daily, 9,400 ft^3/s, Oct. 20, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10700	15000	20400	22200	20100	21000	14600	18000	20300	19500	18900	18300
2	10700	16300	20500	23200	20300	20800	14100	18200	20100	20200	18800	18200
3	10300	17200	20400	23400	19700	19900	13700	18300	20500	19800	18700	18300
4	10900	16800	20400	24100	19900	18000	15600	18600	20500	20000	17700	15200
5	10800	17000	20400	24500	17300	16100	18000	18800	20200	20100	17700	12600
6	10700	17300	20600	24300	17700	16100	17700	18000	20300	19900	18000	11000
7	10700	17400	20500	24800	18200	15800	18400	18200	20200	19900	18100	10500
8	10600	16900	20500	25300	18400	15300	18100	18100	20200	19700	18400	10800
9	10700	18100	18800	25300	19300	14700	18000	18900	20100	19800	18100	9500
10	10600	17200	18000	25200	19700	14800	18500	18300	20200	20000	17900	10000
11	10800	17600	18300	25200	17300	13900	17800	18200	20300	20000	18100	10600
12	11100	17000	18300	22400	17400	13900	18100	18500	20200	20100	17800	9700
13	11300	18600	18300	21800	17400	14000	18500	18200	20200	19700	18500	9700
14	11100	19700	18300	25400	17900	14100	18100	18000	20300	20000	18300	10000
15	11500	21000	17800	25200	17700	14200	18200	18300	20200	19600	18100	9700
16	10200	20300	18600	25200	17900	13900	18600	17900	20200	19600	18200	9700
17	10900	20800	18800	25100	18700	13900	18300	18100	20000	19800	18100	9700
18	10600	20600	19300	25400	18800	13900	18100	20300	20300	19900	18300	9900
19	10600	19800	19100	25100	19800	14500	17900	20200	20100	19700	17900	9500
20	10400	19900	19000	25500	19900	14100	18100	20300	20100	19800	17800	9400
21	10400	19900	19800	25200	21100	14000	18000	20100	20200	19700	17800	9500
22	10400	20200	19800	25300	21600	14600	18300	20400	20100	19500	17800	9800
23	12100	21100	20500	25000	21400	13900	18200	20200	20100	20000	18400	9400
24	10800	20100	20100	25400	21300	14000	17900	20400	20000	20100	18600	9900
25	10800	20500	20900	25400	20800	13800	17800	20200	20200	20100	17600	9900
26	10700	20600	21200	25100	20900	14100	18200	20200	20200	19800	17700	10100
27	10800	20800	21300	25200	21100	13900	18300	20300	20000	19900	19100	9900
28	10700	21000	21300	25600	20600	14200	18200	20300	20000	18400	18300	9900
29	10400	20800	21600	19900	---	14400	18300	20300	20100	19100	18000	9600
30	13200	20900	22300	20000	---	13500	18500	20500	20100	18600	18200	9500
31	14700	---	22300	20200	---	14300	---	20400	---	18400	18100	---
TOTAL	340200	570400	617400	750900	542200	467600	530100	594700	605500	610700	563000	329800
MEAN	10970	19010	19920	24220	19360	15080	17670	19180	20180	19700	18160	10990
MAX	14700	21100	22300	25600	21600	21000	18600	20500	20500	20200	19100	18300
MIN	10200	15000	17800	19900	17300	13500	13700	17900	20000	18400	17600	9400
AC-FT	674800	1131000	1225000	1489000	1075000	927500	1051000	1180000	1201000	1211000	1117000	654200

CAL YR 1989 TOTAL 6798300 MEAN 18630 MAX 24500 MIN 10100 AC-FT 13480000
WTR YR 1990 TOTAL 6522500 MEAN 17870 MAX 25600 MIN 9400 AC-FT 12940000

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

LOCATION.--Samples collected at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
NOV												
29...	0920	20800	750	8.4	2.0	9.5	0.50	9.9	86	<1	K1	230
JAN												
10...	0930	25200	720	8.4	12.0	4.5	0.40	11.5	91	<1	K1	230
FEB												
14...	0930	17900	670	8.5	-12.0	4.0	1.0	12.2	92	<1	K7	210
APR												
11...	0910	17800	660	8.4	-1.0	5.0	1.1	11.8	91	<1	K7	210
MAY												
31...	0855	20400	665	8.3	17.0	11.0	0.60	10.7	98	<1	K9	220
AUG												
22...	0910	17800	710	8.1	21.5	14.5	1.7	5.8	57	<1	--	240

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV												
29...	54	23	65	38	2	3.9	173	202	5	190	10	0.60
JAN												
10...	54	22	64	38	2	4.3	160	176	10	190	10	0.40
FEB												
14...	51	21	61	38	2	4.3	174	164	24	180	9.5	0.50
APR												
11...	50	20	58	37	2	4.0	168	176	14	190	8.8	0.70
MAY												
31...	52	21	59	37	2	3.8	153	186	0	180	8.7	0.50
AUG												
22...	57	23	62	36	2	3.9	168	205	0	190	11	0.70

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
NOV											
29...	6.6	461	459	0.63	25900	<0.010	0.110	0.010	<0.010	0.30	0.010
JAN											
10...	7.2	448	449	0.61	30500	<0.010	<0.100	0.020	0.030	0.30	<0.010
FEB											
14...	6.6	457	439	0.62	22100	<0.010	<0.100	0.020	0.010	0.30	0.020
APR											
11...	6.4	427	439	0.58	20500	<0.010	<0.100	0.010	0.020	0.30	<0.010
MAY											
31...	6.4	421	423	0.57	23200	<0.010	<0.100	<0.010	<0.010	0.40	<0.010
AUG											
22...	6.5	458	456	0.62	22000	<0.010	0.200	<0.010	<0.010	0.50	0.010

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
NOV 29...	<0.010	<0.010	<10	2	53	<0.5	<1.0	<1	<3	3	6
JAN 10...	0.010	0.010	--	--	--	--	--	--	--	--	--
FEB 14...	<0.010	<0.010	<10	2	57	<0.5	<1.0	<5	<3	<10	10
APR 11...	<0.010	<0.010	<10	2	55	<0.5	<1.0	1	<3	2	11
MAY 31...	<0.010	<0.010	--	--	--	--	--	--	--	--	--
AUG 22...	<0.010	<0.010	10	2	57	<0.5	2.0	<1	<3	3	4

DATE	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
NOV 29...	<1	55	4	<0.1	<10	2	<1	<1.0	550	<6	17
FEB 14...	20	47	<1	<0.1	<10	<10	1	2.0	540	<6	22
APR 11...	1	48	5	0.1	10	2	<1	<1.0	490	<6	12
AUG 22...	<1	55	<1	<0.1	<10	2	<1	<1.0	560	<6	6

06339010 MISSOURI RIVER ABOVE STANTON, ND

LOCATION.--Lat 47°21'45", long 101°21'25", SE$^1/_4$NE$^1/_4$SE$^1/_4$ sec.22, T.145 N., R.84 W., McLean County, Hydrologic Unit 10130101, on left bank 9 mi south of Riverdale, and at mile 1,379.

DRAINAGE AREA.--181,400 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1600.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 13 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 72.24 ft, Jan. 29, 1977; minimum daily recorded, 63.91 ft, Sept. 12, 1990.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64.57	65.35	66.53	66.94	66.37	66.48	65.24	65.87	66.46	66.39	66.13	65.99
2	64.55	65.59	66.42	66.81	66.44	66.54	65.15	65.97	66.01	66.43	66.13	66.02
3	64.48	65.84	66.47	66.99	66.40	66.40	65.12	66.07	66.07	66.46	66.14	66.09
4	64.51	65.84	66.53	67.14	66.35	66.04	65.31	66.09	66.48	66.43	65.98	65.53
5	64.56	65.68	66.46	67.20	66.06	65.87	65.80	65.90	66.44	66.44	65.98	65.07
6	64.50	65.92	66.42	67.22	65.98	65.61	65.91	66.13	66.42	66.43	65.99	64.36
7	64.52	65.79	66.50	67.24	66.06	65.57	66.00	65.96	66.46	66.47	66.06	64.26
8	64.51	65.81	66.45	67.40	65.85	65.46	65.97	65.93	66.41	66.40	66.04	64.31
9	64.50	65.94	66.16	67.41	66.08	65.49	65.92	65.94	66.43	66.42	66.06	64.09
10	64.50	65.95	66.04	67.35	66.10	65.32	66.10	66.11	66.42	66.42	66.01	64.17
11	64.43	65.80	66.08	67.36	65.78	65.21	65.76	65.96	66.44	66.41	66.04	64.36
12	64.78	65.82	66.17	66.98	65.93	65.11	66.06	66.00	66.41	66.40	66.01	64.16
13	64.46	66.14	65.92	66.69	65.81	65.18	66.02	66.08	66.41	66.40	66.08	63.91
14	64.76	65.99	65.13	67.23	65.77	65.27	66.03	65.90	66.42	66.41	66.02	64.09
15	64.73	66.56	65.34	67.44	65.89	65.25	65.93	65.97	66.43	66.36	66.02	64.12
16	64.16	66.42	66.22	67.38	65.95	65.05	65.94	65.93	66.42	66.39	66.07	64.10
17	64.42	66.47	66.01	67.32	65.91	65.16	66.09	65.89	66.43	66.35	66.00	64.12
18	64.50	66.60	65.74	67.35	65.94	65.09	65.96	66.29	66.44	66.37	66.05	64.11
19	64.42	66.37	64.87	67.38	66.15	65.18	66.01	66.40	66.44	66.37	66.02	64.12
20	64.47	66.25	65.22	67.37	66.32	65.20	65.94	66.38	66.42	66.36	66.05	64.10
21	64.36	66.57	63.97	67.31	66.52	65.32	66.02	66.45	66.43	66.35	66.05	64.08
22	64.39	66.35	65.33	67.41	66.65	65.12	66.02	66.38	66.41	66.31	65.97	64.06
23	64.76	66.49	67.78	67.32	66.61	65.29	65.90	66.42	66.41	66.37	66.06	64.11
24	64.60	66.52	67.04	67.38	66.51	65.06	65.95	66.43	66.41	66.38	66.06	64.12
25	64.44	66.49	66.78	67.35	66.67	65.21	65.92	66.44	66.43	66.40	66.01	64.35
26	64.50	66.47	66.57	67.38	66.47	65.18	65.94	66.44	66.41	66.37	65.90	64.23
27	64.44	66.53	66.85	67.37	66.59	65.06	65.66	66.42	66.47	66.35	66.06	64.13
28	64.43	66.52	66.63	67.34	66.55	65.28	65.77	66.43	66.37	66.19	66.19	64.16
29	64.48	66.62	66.71	66.85	---	65.16	65.80	66.43	66.43	66.13	65.95	64.24
30	64.80	66.54	66.86	66.28	---	65.17	65.53	66.48	66.43	66.11	66.01	64.20
31	65.26	---	66.86	66.53	---	65.27	---	66.49	---	66.06	66.16	---
MEAN	64.54	66.17	66.20	67.18	66.20	65.41	65.83	66.18	66.40	66.36	66.04	64.43
MAX	65.26	66.62	67.78	67.44	66.67	66.54	66.10	66.49	66.48	66.47	66.19	66.09
MIN	64.16	65.35	63.97	66.28	65.77	65.05	65.12	65.87	66.01	66.06	65.90	63.91

CAL YR 1989 MEAN 66.33 MAX 69.55 MIN 63.97
WTR YR 1990 MEAN 65.91 MAX 67.78 MIN 63.91

06339100 KNIFE RIVER AT MANNING, ND

LOCATION.--Lat 47°14'10", long 102°46'10", in SE¼NW¼ sec.6, T.143 N., R.95 W., Dunn County, Hydrologic Unit 10130201, on left bank 50 ft downstream from bridge on State Highway 22, and 0.4 mi north of Manning.

DRAINAGE AREA.--205 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,156.55 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 31 to Nov. 2, Nov. 14 to Mar. 26, and May 10-18. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--23 years, 20.3 ft^3/s, 14,710 acre-ft/yr; median of yearly mean discharges, 21 ft^3/s, 15,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,940 ft^3/s, June 15, 1970, gage height, 16.20 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 28	1920	*20	*7.14				

No flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.90	e.90	e.72	e.32	e1.8	1.6	1.8	2.1	2.3	.00	.00
2	.00	e.80	e.82	e.74	e.27	e1.5	1.6	.87	1.7	1.3	.05	.00
3	.00	.90	e.90	e.74	e.23	e1.3	1.4	.69	1.3	.77	.06	.00
4	.00	1.0	e1.0	e.75	e.24	e1.2	1.5	.67	.98	.47	.03	.00
5	.00	1.4	e1.2	e.75	e.25	e1.1	1.3	.72	.72	.98	.00	.00
6	.00	1.5	e1.1	e.76	e.27	e1.0	.87	.46	.59	1.0	.00	.00
7	.00	1.3	e1.0	e.78	e.26	e.95	.89	.73	.80	.77	.00	.00
8	.00	1.6	e1.0	e.82	e.25	e1.0	1.1	.75	1.5	.53	.00	.00
9	.00	1.3	e1.0	e.82	e.23	e1.0	.70	1.1	1.6	.41	.00	.00
10	.00	1.4	e.96	e.85	e.24	e1.1	.64	e.50	2.1	.36	.00	.00
11	.02	1.4	e.90	e.82	e.25	e1.3	.49	e.10	2.2	.36	.00	.00
12	.01	1.3	e.84	e.76	e.28	e1.4	.53	e.00	1.8	.34	.00	.00
13	.00	1.2	e.74	e.72	e.24	e1.3	.54	e.00	1.7	.31	.00	.00
14	.00	e1.1	e.66	e.72	e.21	e1.1	.41	e1.0	1.3	.29	.00	.00
15	.00	e1.0	e.60	e.70	e.18	e1.0	.35	e.60	1.0	.27	.00	.00
16	.00	e.85	e.50	e.68	e.14	e1.1	.42	e1.6	2.0	.26	.00	.00
17	.33	e.70	e.45	e.63	e.12	e1.3	.57	e1.3	4.7	.25	.00	.00
18	.26	e1.2	e.40	e.57	e.10	e1.4	.38	e1.1	10	.23	.00	.00
19	.21	e1.0	e.36	e.50	e.10	e1.7	.39	.96	9.5	.21	.00	.00
20	.20	e1.1	e.32	e.44	e.14	e2.0	.37	.78	5.6	.19	.00	.00
21	.14	e1.0	e.28	e.40	e.20	e2.1	.28	.98	3.2	.16	.00	.00
22	.17	e.87	e.26	e.42	e.35	e1.8	.42	.96	2.6	.13	.00	.00
23	.20	e.76	e.26	e.44	e.70	e1.5	.49	.87	1.8	.10	.00	.00
24	.20	e.82	e.30	e.45	e.60	e1.3	.53	.68	1.1	.07	.00	.00
25	.23	e.90	e.35	e.46	e.75	e1.2	2.2	2.5	.72	.04	.00	.00
26	.26	e.88	e.45	e.50	e1.0	e1.2	3.7	5.7	.59	.03	.00	.00
27	.92	e.82	e.60	e.48	e1.1	1.3	6.4	8.9	.63	.04	.00	.00
28	2.0	e.70	e.70	e.46	e1.4	1.5	4.4	6.2	11	.01	.00	.00
29	1.4	e.74	e.72	e.45	---	1.4	2.9	4.7	11	.00	.00	.00
30	1.1	e.84	e.72	e.40	---	1.9	2.2	4.3	4.7	.00	.00	.00
31	e1.0	---	e.70	e.36	---	1.7	---	2.9	---	.00	.00	---
TOTAL	8.65	31.28	20.99	19.09	10.42	42.45	39.57	54.42	90.53	12.18	0.14	0.00
MEAN	.28	1.04	.68	.62	.37	1.37	1.32	1.76	3.02	.39	.005	.000
MAX	2.0	1.6	1.2	.85	1.4	2.1	6.4	8.9	11	2.3	.06	.00
MIN	.00	.70	.26	.36	.10	.95	.28	.00	.59	.00	.00	.00
AC-FT	17	62	42	38	21	84	78	108	180	24	.3	.00

CAL YR 1989 TOTAL 4357.61 MEAN 11.9 MAX 351 MIN .00 AC-FT 8640
WTR YR 1990 TOTAL 329.72 MEAN .90 MAX 11 MIN .00 AC-FT 654

e Estimated

06339100 KNIFE RIVER AT MANNING, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
22...	1140	0.85	2440	--	-3.0	1.5	--	--	--	--	--	--
JAN												
05...	1130	0.75	3260	--	-8.5	1.0	--	--	--	--	--	--
FEB												
20...	1420	0.13	3380	--	12.0	1.0	--	--	--	--	--	--
MAR												
05...	1115	1.1	2420	--	0.5	1.0	--	--	--	--	--	--
30...	1135	1.7	1520	8.2	16.5	3.0	130	25	17	310	83	12
MAY												
08...	0930	0.70	1790	--	12.0	10.5	--	--	--	--	--	--
JUN												
01...	1115	2.1	2100	--	22.5	21.0	--	--	--	--	--	--
19...	0940	9.1	2080	--	22.0	19.0	--	--	--	--	--	--
JUL												
09...	0850	0.42	1650	8.4	21.5	21.0	130	24	16	330	84	13

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	5.8	490	11	420	390	6.4	0.60	7.3	1010	1020	1.37
JUL											
09...	7.3	550	0	447	420	7.5	0.60	5.1	1120	1080	1.52

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
30...	4.64	2	330	170	<1	31	10	0.1	<1	1	340
JUL											
09...	1.27	4	410	340	<1	30	50	0.1	<1	<1	400

06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND

LOCATION.--Lat 47°09'40", long 102°03'39", in SE¼ sec.34, T.143 N., R.90 W., Mercer County, Hydrologic Unit 10130201, on left bank 6 ft downstream from highway bridge, 4.5 mi downstream from Elm Creek, and 9 mi south of Golden Valley.

DRAINAGE AREA.--1,230 mi², approximately.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS (WATER YEARS).--WSP 1006:0 Drainage area. WSP 1279: 1904, 1914-19(M), 1922-24(M), 1944.

GAGE.--Water-stage recorder. Datum of gage is 1,847.13 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to May 1, 1946.

REMARKS.--Estimated daily discharges: Oct. 1 to Apr. 5, Apr. 14-20, Apr. 29 to May 4, and Sept. 23-30. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--64 years (1904-06, 1908-15, 1917-19, 1922-24, 1944-90), 93.8 ft³/s, 67,960 acre-ft/yr; median of yearly mean discharges, 86 ft³/s, 62,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft³/s, 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.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 26, 27, 1943 reached a stage of 26.7 ft, from floodmark, 11,500 ft³/s. The 1943 flood was the highest since 1903 according to information from local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 27	1530	*560	*8.08				

Minimum daily discharge, 0.07 ft³/s, Aug. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.1	e3.5	e3.6	e2.6	e1.1	e6.2	e13	e13	31	113	.54	.77
2	e1.2	e3.2	e3.5	e2.6	e.85	e7.8	e12	e11	23	125	.46	.57
3	e1.4	e3.4	e3.7	e2.5	e.70	e8.3	e11	e10	19	63	.40	.48
4	e1.4	e3.8	e4.0	e2.3	e.90	e8.2	e11	e9.3	17	37	.36	.39
5	e1.6	e4.2	e4.2	e2.0	e1.1	e8.0	e10	9.9	14	25	.33	243
6	e1.6	e4.8	e4.0	e2.1	e1.4	e7.8	10	8.7	11	19	.29	101
7	e1.7	e5.2	e3.6	e2.3	e1.8	e7.6	10	7.3	9.0	15	.21	30
8	e1.9	e5.0	e3.2	e2.4	e2.0	e7.8	10	6.4	8.2	11	.13	21
9	e2.1	e4.8	e3.3	e2.6	e1.9	e8.3	10	5.5	7.9	9.3	.08	13
10	e2.2	e5.0	e2.9	e3.1	e2.1	e10	9.6	5.0	7.5	8.7	.07	8.6
11	e2.2	e5.2	e2.5	e2.9	e2.3	e13	9.3	5.0	6.9	16	.10	6.3
12	e2.1	e5.4	e2.2	e2.6	e2.6	e15	9.0	4.6	6.6	44	.13	4.9
13	e2.3	e5.2	e2.0	e2.5	e2.4	e13	9.3	4.4	6.4	26	.16	3.6
14	e2.8	e5.0	e1.7	e2.6	e2.1	e11	e9.6	4.1	6.0	13	.16	2.9
15	e3.0	e4.5	e1.4	e2.5	e1.9	e10	e10	5.7	6.6	8.8	.16	2.3
16	e2.8	e3.8	e1.2	e2.4	e1.6	e13	e11	5.0	7.2	6.7	.14	1.8
17	e2.6	e3.0	e1.0	e2.3	e1.4	e16	e11	4.2	15	5.9	.13	1.5
18	e2.8	e3.2	e.85	e2.1	e1.4	e20	e10	4.1	19	4.3	.12	1.4
19	e2.7	e4.0	e.65	e1.8	e1.5	e16	e9.2	4.1	152	3.4	.15	1.3
20	e2.6	e4.7	e.50	e1.6	e1.7	e18	e8.4	4.2	106	2.6	.18	1.6
21	e2.5	e5.1	e.40	e1.7	e2.0	e16	7.8	4.6	75	2.1	.21	1.6
22	e2.4	e4.8	e.30	e1.9	e2.4	e13	8.1	4.5	59	1.7	.26	1.7
23	e2.5	e4.2	e.25	e2.1	e3.1	e11	8.7	4.5	43	1.5	.27	e1.6
24	e2.7	e4.4	e.40	e2.1	e2.9	e10	9.0	4.2	31	1.3	100	e1.4
25	e3.2	e4.6	e.60	e2.0	e3.5	e11	9.3	4.6	25	1.0	113	e1.3
26	e3.5	e4.4	e1.0	e2.2	e4.8	e13	11	11	20	.83	19	e1.1
27	e3.4	e4.0	e1.4	e2.2	e5.0	e15	11	281	18	.96	7.0	e1.2
28	e3.8	e3.5	e2.0	e2.3	e5.2	e14	12	235	31	.84	3.7	e2.5
29	e4.2	e3.3	e2.5	e2.4	---	e13	e13	110	33	.70	2.5	e1.3
30	e4.0	e3.4	e2.8	e2.0	---	e12	e14	67	38	.64	1.8	e1.0
31	e3.8	---	e2.7	e1.6	---	e12	---	43	---	.58	1.3	---
TOTAL	78.1	128.6	64.35	70.3	61.65	365.0	307.3	900.9	852.3	568.85	253.34	461.11
MEAN	2.52	4.29	2.08	2.27	2.20	11.8	10.2	29.1	28.4	18.3	8.17	15.4
MAX	4.2	5.4	4.2	3.1	5.2	20	14	281	152	125	113	243
MIN	1.1	3.0	.25	1.6	.70	6.2	7.8	4.1	6.0	.58	.07	.39
AC-FT	155	255	128	139	122	724	610	1790	1690	1130	502	915

CAL YR 1989 TOTAL 10787.42 MEAN 29.6 MAX 558 MIN .25 AC-FT 21400
WTR YR 1990 TOTAL 4111.80 MEAN 11.3 MAX 281 MIN .07 AC-FT 8160

e Estimated

06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
02...	0935	1.0	1920	--	3.0	10.0	--	--	--	--	--	--
NOV												
21...	1135	5.2	2940	--	4.5	1.5	--	--	--	--	--	--
JAN												
02...	1045	2.6	3580	--	-4.5	0.5	--	--	--	--	--	--
FEB												
20...	1130	1.7	3680	--	7.5	0.5	--	--	--	--	--	--
MAR												
09...	1000	8.2	2570	--	5.5	1.0	--	--	--	--	--	--
26...	1110	12	2100	8.6	6.0	1.5	240	42	33	430	79	12
MAY												
07...	1125	7.4	2130	--	14.0	15.5	--	--	--	--	--	--
JUN												
07...	1225	9.7	1540	--	24.5	19.5	--	--	--	--	--	--
20...	1010	112	1920	--	26.5	21.0	--	--	--	--	--	--
JUL												
31...	1215	0.63	1560	8.7	31.5	25.0	180	31	25	280	76	9
SEP												
04...	1015	0.39	730	--	23.0	20.5	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
26...	8.9	590	21	520	650	7.1	0.60	5.7	1490	1490	2.03
JUL											
31...	12	470	0	387	430	8.4	0.50	10	1070	1030	1.46

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
26...	48.7	3	310	30	<1	42	20	0.1	<1	1	710
JUL											
31...	1.82	6	280	40	<1	26	10	0.1	1	1	580

06339560 BRUSH CREEK NEAR BEULAH, ND

LOCATION.--Lat 47°10'43", long 101°47'05", in NW¼SW¼NW¼ sec.25, T.143 N., R.88 W., Mercer County, Hydrologic Unit 10130201, on right bank 60 ft upstream from bridge on State Highway 49, and 6 mi south of Beulah.

DRAINAGE AREA.--23.92 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,948 ft above National Geodetic Vertical Datum of 1929, from State Highway Department levels.

REMARKS.--Estimated daily discharges: Nov. 16 to Mar. 14, May 24 to 30, and June 18-20. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--16 years, 1.65 ft³/s, 1,200 acre-ft/yr; median of yearly mean discharges, 1.5 ft³/s, 1,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 940 ft³/s, Mar. 29, 1982, gage height, 8.40 ft, backwater from ice; maximum gage height, 9.26 ft, Mar. 21, 1978; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (*).

Date	Time	Discharge (ft³/s)	Gage Height (ft)	Date	Time	Discharge (ft³/s)	Gage Height (ft)
June 28	0745	3.1	4.06				

No flow for may days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.26	e.14	e.00	e.00	e.01	.67	.47	.33	.44	.08	.04
2	.21	.26	e.13	e.00	e.00	e.02	.61	.47	.38	.34	.08	.04
3	.21	.27	e.14	e.00	e.00	e1.0	.60	.48	.44	.37	.08	.03
4	.23	.30	e.13	e.00	e.00	e.80	.61	.43	.35	.33	.08	.02
5	.24	.30	e.12	e.00	e.00	e.60	.54	.43	.32	.26	.08	.13
6	.24	.28	e.11	e.00	e.00	e.40	.49	.43	.31	.22	.08	.09
7	.24	.28	e.10	e.00	e.00	e.30	.50	.42	.27	.23	.05	.09
8	.25	.26	e.10	e.00	e.00	e.28	.53	.40	.28	.21	.04	.08
9	.24	.26	e.09	e.00	e.00	e.35	.49	.62	.24	.20	.05	.07
10	.24	.26	e.08	e.00	e.00	e.50	.43	.77	.22	.24	.05	.07
11	.24	.26	e.05	e.00	e.00	e2.0	.39	.56	.21	.34	.06	.07
12	.24	.25	e.04	e.00	e.00	e1.8	.40	.57	.20	.24	.06	.07
13	.25	.24	e.03	e.00	e.00	e1.4	.42	.55	.23	.20	.05	.08
14	.25	.24	e.02	e.00	e.00	e1.2	.46	.50	.23	.19	.04	.07
15	.23	.24	e.02	e.00	e.00	.98	.49	.45	.58	.18	.04	.07
16	.25	e.20	e.01	e.00	e.00	.85	.53	.40	.51	.16	.04	.07
17	.24	e.19	e.01	e.00	e.00	.85	.54	.37	1.1	.13	.04	.08
18	.24	e.18	e.01	e.00	e.00	.67	.55	.53	e.58	.13	.04	.08
19	.24	e.20	e.00	e.00	e.00	.70	.52	1.3	e1.1	.13	.04	.08
20	.25	e.19	e.00	e.00	e.00	1.0	.61	.95	e.60	.12	.05	.09
21	.26	e.17	e.00	e.00	e.00	.88	.65	.80	.42	.12	.04	.08
22	.26	e.17	e.00	e.00	e.00	.60	.65	.45	.34	.12	.04	.08
23	.27	e.16	e.00	e.00	e.00	.48	.56	.43	.28	.12	.04	.09
24	.27	e.16	e.00	e.00	e.00	.46	.47	e.38	.25	.12	.06	.09
25	.26	e.17	e.00	e.00	e.00	.43	.64	e.60	.23	.12	.06	.09
26	.26	e.16	e.00	e.00	e.00	.58	.66	e1.0	.22	.11	.05	.08
27	.30	e.15	e.00	e.00	e.00	.67	.57	e.70	.25	.10	.05	.08
28	.29	e.14	e.00	e.00	e.00	.64	.60	e.50	1.6	.10	.04	.09
29	.27	e.15	e.00	e.00	---	.55	.57	e.45	.61	.09	.04	.08
30	.26	e.15	e.00	e.00	---	.61	.48	e.43	.52	.10	.03	.09
31	.26	---	e.00	e.00	---	.65	---	.37	---	.10	.04	---
TOTAL	7.69	6.50	1.33	0.00	0.00	22.26	16.23	17.21	13.20	5.86	1.62	2.27
MEAN	.25	.22	.043	.000	.000	.72	.54	.56	.44	.19	.052	.076
MAX	.30	.30	.14	.00	.00	2.0	.67	1.3	1.6	.44	.08	.13
MIN	.20	.14	.00	.00	.00	.01	.39	.37	.20	.09	.03	.02
AC-FT	15	13	2.6	.00	.00	44	32	34	26	12	3.2	4.5

CAL YR 1989 TOTAL 331.85 MEAN .91 MAX 58 MIN .00 AC-FT 658
WTR YR 1990 TOTAL 94.17 MEAN .26 MAX 2.0 MIN .00 AC-FT 187

e Estimated

06339560 BRUSH CREEK NEAR BEULAH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT												
04...	1044	0.22	1860	--	9.0	7.0	--	--	--	--	--	--
NOV												
29...	1406	0.15	2060	7.8	7.5	1.0	11.1	79	580	100	81	280
MAR												
14...	1347	1.2	1880	--	1.0	0.0	--	--	--	--	--	--
20...	1230	0.97	1770	8.1	11.0	6.0	10.1	82	490	91	65	220
APR												
05...	1035	0.55	1620	8.2	1.0	3.5	11.2	85	450	84	58	210
MAY												
30...	1205	0.43	2300	--	22.0	18.5	--	--	--	--	--	--
JUN												
27...	1103	0.24	1950	8.1	28.5	23.0	7.3	87	470	71	72	290
AUG												
20...	1306	0.05	1920	8.1	25.0	18.0	6.7	71	470	82	64	310

DATE	SODIUM AD-SORP-TION RATIO (00931)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
NOV												
29...	5	529	564	688	0	660	6.4	1480	11	<0.010	<0.100	40
MAR												
20...	4	383	404	493	0	550	7.8	1330	5	<0.010	<0.100	42
APR												
05...	4	400	402	491	0	540	5.1	1170	<1	<0.010	<0.100	35
JUN												
27...	6	505	492	600	0	600	7.0	1390	13	<0.010	<0.100	290
AUG												
20...	6	594	568	693	0	520	9.7	1370	13	<0.010	<0.100	17

06340000 SPRING CREEK AT ZAP, ND

LOCATION.--Lat 47°17'10", long 101°55'31", in SW¼ sec.14, T.144 N., R.89 W., Mercer County, Hydrologic Unit 10130201, on right bank 250 ft downstream from Burlington Northern Railway bridge in Zap, and 9 mi upstream from mouth.

DRAINAGE AREA.--549 mi².

WATER-DISCHARGE RECORDS

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 National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Oct. 18, Oct. 29 to Mar. 20, and July 23 to Aug. 23. Records good except those for periods of estimated daily discharges, which are fair. Flow slightly regulated by Lake Ilo, 56 mi upstream, capacity 7,130 acre-ft.

AVERAGE DISCHARGE.--45 years, 42.2 ft³/s, 30,580 acre-ft/yr; median of yearly mean discharges, 39 ft³/s, 28,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,130 ft³/s, Apr. 7, 1952, gage height, 20.03 ft; maximum gage height, 20.70 ft, Mar. 15, 1972; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--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.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage Height (ft)
Aug. 24	2215	2510	15.67	No other peaks greater than base discharge.			

Minimum daily discharge, 2.0 ft³/s, Dec. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	e6.8	e6.7	e5.5	e5.5	e7.0	12	16	13	48	e3.8	12
2	5.6	e6.6	e6.7	e5.8	e5.0	e7.0	12	13	14	39	e3.7	11
3	5.0	e7.2	e7.0	e5.8	e6.0	e7.4	12	11	14	33	e3.5	9.9
4	4.9	e7.2	e7.0	e5.8	e7.0	e7.6	11	10	13	28	e3.4	9.2
5	5.4	e7.4	e6.8	e6.0	e7.2	e8.0	11	9.7	12	21	e3.3	12
6	5.6	e7.4	e6.6	e6.4	e7.0	e8.0	11	9.3	11	18	e3.2	14
7	5.6	e7.6	e6.2	e7.0	e7.0	e8.2	11	8.8	10	16	e3.2	13
8	5.6	e9.0	e5.8	e7.0	e6.8	e8.4	10	8.3	11	15	e3.1	12
9	5.9	e8.6	e6.0	e7.0	e6.6	e8.8	10	7.9	9.9	12	e3.0	11
10	6.1	e8.0	e6.0	e7.0	e6.6	e9.0	10	7.5	7.9	12	e3.0	11
11	6.1	e8.0	e5.8	e6.9	e6.6	e14	9.8	7.5	6.9	16	e3.0	10
12	6.7	e7.8	e5.4	e6.5	e6.6	e20	9.8	7.1	6.5	12	e3.0	10
13	7.0	e7.4	e5.4	e6.5	e6.6	e18	9.7	7.0	5.9	9.3	e3.0	9.4
14	5.9	e7.2	e4.0	e6.5	e6.4	e16	9.3	6.7	5.5	9.4	e2.9	8.7
15	5.8	e7.0	e4.3	e6.5	e6.0	e15	9.4	6.9	5.0	9.8	e2.9	8.2
16	5.8	e6.8	e4.0	e6.4	e5.5	e14	9.1	7.4	5.5	9.6	e2.9	7.0
17	5.8	e7.0	e3.7	e6.3	e5.0	e14	9.3	7.4	192	7.7	e2.9	6.4
18	e5.6	e7.0	e3.2	e6.2	e4.6	e12	9.3	7.3	44	6.7	e2.9	6.9
19	5.2	e7.2	e2.5	e6.0	e4.4	e12	9.2	7.3	537	6.5	e2.9	6.6
20	5.7	e7.0	e2.3	e6.0	e4.8	e16	9.4	7.4	292	5.6	e2.8	6.7
21	6.9	e7.0	e2.1	e6.3	e6.0	15	9.3	7.5	113	5.6	e2.8	6.7
22	6.9	e7.0	e2.0	e6.4	e6.0	11	9.7	7.5	65	5.5	e2.8	6.4
23	6.9	e6.6	e2.2	e6.6	e6.2	9.8	9.8	7.1	47	e5.2	e2.8	6.1
24	6.9	e6.8	e3.0	e6.8	e6.0	12	9.8	6.8	37	e4.8	676	5.7
25	6.9	e6.8	e3.5	e7.0	e6.2	9.8	12	8.9	34	e4.5	688	5.3
26	6.9	e6.7	e3.7	e7.2	e6.4	11	15	21	27	e4.5	86	5.0
27	6.9	e6.4	e5.0	e7.2	e6.6	13	22	13	25	e4.3	43	4.7
28	6.9	e6.4	e5.2	e7.0	e7.0	12	26	41	33	e4.2	30	4.9
29	e6.8	e6.6	e5.4	e7.0	---	12	19	26	75	e4.0	21	5.2
30	e6.8	e6.7	e5.2	e6.5	---	11	17	18	82	e3.9	18	5.2
31	e6.8	---	e5.0	e6.0	---	12	---	15	---	e3.8	15	---
TOTAL	190.6	215.2	147.7	201.1	171.6	359.0	353.9	345.3	1754.1	384.9	1647.8	250.2
MEAN	6.15	7.17	4.76	6.49	6.13	11.6	11.8	11.1	58.5	12.4	53.2	8.34
MAX	7.0	9.0	7.0	7.2	7.2	20	26	41	537	48	688	14
MIN	4.9	6.4	2.0	5.5	4.4	7.0	9.1	6.7	5.0	3.8	2.8	4.7
AC-FT	378	427	293	399	340	712	702	685	3480	763	3270	496

CAL YR 1989 TOTAL 5661.75 MEAN 15.5 MAX 190 MIN .40 AC-FT 11230
WTR YR 1990 TOTAL 6021.4 MEAN 16.5 MAX 688 MIN 2.0 AC-FT 11940

e Estimated

06340000 SPRING CREEK AT ZAP, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-70, 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
04...	0919	5.0	1640	--	8.0	7.0	--	--	--	--	--	--
NOV												
30...	0936	6.7	2200	--	4.0	0.0	--	--	--	--	--	--
JAN												
11...	0921	6.9	2650	--	-3.5	0.0	--	--	--	--	--	--
FEB												
15...	0901	6.0	2550	--	-7.0	0.0	--	--	--	--	--	--
MAR												
15...	0856	15	--	--	-1.0	0.0	--	--	--	--	--	--
21...	0842	15	1200	8.2	2.0	0.0	320	62	39	160	52	4
APR												
05...	0856	11	1340	--	-1.0	4.5	--	--	--	--	--	--
MAY												
31...	1402	15	2030	--	29.5	19.5	--	--	--	--	--	--
JUN												
20...	1043	320	--	--	24.0	15.0	--	--	--	--	--	--
27...	0921	25	1260	--	25.0	23.0	--	--	--	--	--	--
AUG												
23...	0918	2.8	1600	8.4	26.0	22.0	310	51	45	250	63	6

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
21...	6.9	360	0	295	370	6.0	0.30	7.1	834	830	1.13
AUG											
23...	8.7	510	0	419	470	11	0.40	4.4	1120	1090	1.52

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
21...	34.2	1	250	30	<1	43	50	0.2	<1	<1	1300
AUG											
23...	8.56	<1	380	20	<1	59	60	0.1	1	<1	1100

06340500 KNIFE RIVER AT HAZEN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°17'07", long 101°37'18", in SW¼SE¼SE¼ sec.18, T.144 N., R.86 W., Mercer County, Hydrologic Unit 10130201, on left bank at downstream side of highway bridge, 0.5 mi south of Hazen, and 3 mi upstream from Antelope Creek.

DRAINAGE AREA.--2,240 mi^2, approximately.

WATER-DISCHARGE RECORDS

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.

REVISED RECORDS.--WSP 1146: 1943. WSP 1279: 1930-31, 1932-33(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,712.35 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 25, 1947, nonrecording gages at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1 to Mar. 26, Apr. 12-18, and Aug. 5-21. Records good except those for periods of estimated daily discharges, which are fair. Slight regulation by Lake Ilo 81 mi upstream, capacity 7,130 acre-ft.

AVERAGE DISCHARGE.--57 years (1930-33, 1938-90), 174 ft^3/s, 126,100 acre-ft/yr; median of yearly mean discharges, 150 ft^3/s, 110,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,300 ft^3/s, June 24, 1966, gage height, 27.01 ft; no flow at times in 1933, 1959, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, the floods of 1943 and 1950 were not exceeded during the period 1884 to 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 25	1145	*1940	10.84	No other peak greater than base dicharge.			

Minimum daily discharge, 7.0 ft^3/s, Aug. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e9.4	e12	e17	e12	e12	e19	39	39	83	122	11	22
2	e9.3	e13	e17	e12	e13	e19	38	42	67	145	10	20
3	e9.6	e14	e18	e12	e15	e19	37	40	58	208	10	18
4	e10	e15	e18	e12	e18	e18	36	38	49	133	10	16
5	e11	e16	e18	e12	e18	e18	35	38	43	94	e9.5	17
6	e12	e16	e19	e13	e17	e19	33	37	37	71	e9.5	282
7	e12	e16	e19	e15	e17	e20	31	34	33	61	e9.0	148
8	e12	e16	e19	e16	e17	e22	29	29	33	48	e9.0	73
9	e12	e17	e19	e16	e17	e24	27	27	31	39	e8.5	45
10	e12	e16	e19	e17	e17	e30	26	24	27	33	e8.2	35
11	e11	e15	e18	e16	e16	e50	26	23	23	122	e8.0	26
12	e11	e14	e18	e14	e17	e60	e25	23	21	89	e8.0	21
13	e12	e13	e17	e14	e16	e64	e25	21	20	58	e7.8	18
14	e12	e14	e17	e15	e15	e66	e25	19	19	67	e7.8	17
15	e12	e13	e15	e14	e13	e70	e25	21	19	43	e7.6	15
16	e12	e13	e14	e14	e12	e66	e25	22	19	31	e7.6	15
17	e11	e12	e12	e14	e13	e60	e25	21	116	24	e7.4	14
18	e11	e14	e12	e14	e13	e50	e25	21	204	22	e7.4	13
19	e12	e14	e11	e13	e13	e54	24	22	342	20	e7.4	13
20	e12	e15	e10	e13	e15	e56	23	20	679	19	e7.3	13
21	e12	e15	e9.0	e14	e16	e56	23	19	324	19	e7.3	14
22	e12	e15	e10	e14	e16	e54	23	19	185	18	7.0	14
23	e12	e16	e11	e13	e17	e50	23	19	137	17	7.4	14
24	e13	e17	e12	e14	e16	e50	22	18	106	15	7.5	13
25	e13	e17	e12	e14	e17	e47	24	19	85	14	1230	13
26	e13	e17	e13	e15	e17	e43	26	40	70	14	333	13
27	e13	e16	e14	e16	e18	40	29	63	66	13	110	12
28	e13	e17	e13	e15	e18	44	33	222	62	13	58	12
29	e14	e17	e12	e16	---	42	46	297	73	12	38	12
30	e13	e17	e12	e15	---	39	41	161	146	12	30	12
31	e13	---	e11	e13	---	39	---	111	---	12	25	---
TOTAL	366.3	452	456.0	437	439	1308	869	1549	3177	1608	2024.2	970
MEAN	11.8	15.1	14.7	14.1	15.7	42.2	29.0	50.0	106	51.9	65.3	32.3
MAX	14	17	19	17	18	70	46	297	679	208	1230	282
MIN	9.3	12	9.0	12	12	18	22	18	19	12	7.0	12
AC-FT	727	897	904	867	871	2590	1720	3070	6300	3190	4020	1920

CAL YR 1989 TOTAL 21980.8 MEAN 60.2 MAX 800 MIN 5.0 AC-FT 43600
WTR YR 1990 TOTAL 13655.5 MEAN 37.4 MAX 1230 MIN 7.0 AC-FT 27090

e Estimated

06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 51, 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
02...	1400	9.3	1540	--	9.5	11.0	--	--	--	--	--
NOV											
28...	1203	17	2060	8.2	-3.5	0.5	4.0	12.8	89	<1	200
JAN											
09...	1142	16	2350	--	2.0	0.0	--	--	--	--	--
FEB											
13...	1150	16	2450	8.3	-10.0	0.0	1.9	12.1	82	K9	98
MAR											
14...	1155	66	1710	--	1.0	0.0	--	--	--	--	--
20...	1050	56	1500	--	10.5	3.5	--	--	--	--	--
APR											
04...	1239	34	1560	--	11.0	9.0	--	--	--	--	--
10...	1112	26	1580	8.5	1.0	4.5	3.5	12.0	92	K1	94
MAY											
29...	1019	303	2340	--	25.0	19.5	--	--	--	--	--
JUN											
01...	0805	86	1260	--	19.0	19.0	--	--	--	--	--
20...	1231	741	720	--	25.0	18.0	--	--	--	--	--
26...	1345	69	1180	--	38.0	28.0	--	--	--	--	--
AUG											
21...	0907	7.3	1440	8.4	20.0	20.0	8.5	7.7	85	230	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
NOV										
28...	390	73	50	320	64	7	9.4	528	560	683
FEB										
13...	470	95	57	400	64	8	10	655	720	879
APR										
10...	290	58	34	260	66	7	7.2	433	442	451
AUG										
21...	300	57	39	230	61	6	10	457	456	517

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
NOV										
28...	0	540	7.0	0.40	8.5	1370	1350	1.86	63.6	0.030
FEB										
13...	0	700	7.0	0.50	14	1710	1720	2.33	72.0	<0.010
APR										
10...	43	480	7.2	0.40	7.8	1100	1120	1.50	77.2	<0.010
AUG										
21...	19	390	9.5	0.30	11	982	1020	1.34	19.3	<0.010

06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV										
28...	<0.100	0.040	0.040	0.50	0.020	<0.010	<0.010	20	<1	53
FEB										
13...	<0.100	0.040	0.040	0.80	0.030	<0.010	<0.010	<10	<1	<100
APR										
10...	<0.100	0.010	0.020	0.80	0.030	<0.010	<0.010	<10	<1	44
AUG										
21...	<0.100	0.010	<0.010	1.1	0.080	<0.010	<0.010	10	2	100

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV										
28...	<0.5	2.0	<1	<1	5	16	1	61	95	<0.1
FEB										
13...	<10	<1.0	1	1	3	30	<1	60	150	0.1
APR										
10...	<0.5	<1.0	3	1	12	14	3	44	66	<0.1
AUG										
21...	<0.5	1.0	<1	<3	2	7	<1	48	17	0.2

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
28...	2	3	<1	3.0	1300	1	19	56	2.6	30
FEB										
13...	2	3	<1	<1.0	1600	1	10	83	3.5	10
APR										
10...	2	3	<1	1.0	950	<1	8	66	4.6	59
AUG										
21...	<10	4	<1	<1.0	1000	<6	<3	116	2.3	80

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV							
28...	1225	0.0	34.0	2070	8.3	1.0	12.9
28...	1227	0.0	30.0	2050	8.2	0.5	--
28...	1230	0.0	26.0	2060	8.2	0.5	--
28...	1232	0.0	22.0	2060	8.2	0.5	--
28...	1235	0.0	18.0	2050	8.3	0.5	12.8
28...	1237	0.0	14.0	2050	8.2	0.5	--
28...	1240	0.0	10.0	2060	8.3	0.5	--
28...	1242	0.0	6.00	2060	8.2	0.5	--
28...	1245	0.0	2.00	2050	8.3	0.5	12.6
AUG							
21...	1024	0.50	2.00	1420	8.3	19.5	7.7
21...	1026	0.50	6.00	1420	8.4	19.5	7.7
21...	1028	0.50	10.0	1420	8.3	20.0	7.7
21...	1030	0.50	14.0	1420	8.3	20.0	7.7
21...	1032	0.50	16.0	1420	8.3	19.5	7.7
21...	1034	0.50	22.0	1420	8.3	19.5	7.7
21...	1036	0.50	26.0	1420	8.3	20.0	7.7
21...	1038	0.50	30.0	1420	8.3	20.0	7.7

06340700 MISSOURI RIVER NEAR STANTON, ND

LOCATION.--Lat 47°17'14", long 101°20'25", in SW¼ sec.16, T.144 N., R.84 W., McLean County, Hydrologic Unit 10130101, on right bank 3 mi southeast of Stanton, 0.1 mi below Ft. Clark irrigation pumping station, 0.4 mi above the United Power Association power plant, and at mile 1,372.

DRAINAGE AREA.--182,000 mi², approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,650.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 50.00 ft lower.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 18 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.56 ft, Feb. 22, 1965; minimum daily recorded, 9.19 ft, Sept. 13, 1990.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.18	10.81	12.60	---	11.99	12.56	11.00	11.88	12.50	12.38	12.10	11.89
2	10.11	10.93	12.42	---	12.58	12.60	10.93	11.95	12.43	12.43	12.08	11.96
3	10.02	11.18	12.47	---	12.62	12.45	10.81	12.07	12.46	12.46	12.07	12.05
4	10.00	11.32	12.58	---	12.43	12.07	11.04	12.07	12.50	12.40	---	11.53
5	10.15	11.27	12.48	---	12.15	11.95	11.65	11.80	12.44	12.43	---	10.88
6	10.02	11.72	12.47	---	11.94	11.49	11.87	12.13	12.42	12.39	---	9.99
7	10.07	11.60	12.57	---	12.04	11.46	11.97	11.88	12.49	12.49	---	9.84
8	10.05	11.65	12.48	---	11.79	11.28	11.95	11.88	12.40	12.34	---	9.82
9	10.01	11.73	12.18	---	12.22	11.33	11.93	11.87	12.44	12.38	---	9.60
10	10.03	11.83	---	---	12.21	11.10	12.11	12.10	12.43	12.39	---	9.53
11	9.92	11.63	---	13.50	11.86	11.01	11.67	11.91	12.44	12.42	---	9.64
12	10.40	11.72	---	13.28	11.93	10.87	12.14	11.94	12.41	12.40	---	9.56
13	9.93	12.06	---	12.77	11.99	10.89	11.96	12.07	12.40	12.38	---	9.19
14	10.45	11.88	---	13.28	11.83	11.04	12.00	11.85	12.41	12.40	---	9.37
15	10.39	12.57	---	13.69	12.00	10.98	11.88	11.90	12.46	12.34	---	9.45
16	9.60	12.19	---	13.61	12.08	10.68	11.93	11.85	12.47	12.36	---	9.42
17	9.96	12.55	---	13.54	12.05	10.84	12.11	11.80	12.50	12.34	---	9.44
18	10.08	12.63	---	13.55	12.10	10.77	11.90	12.24	12.49	12.38	---	9.41
19	9.93	12.36	---	13.62	12.21	10.93	11.97	12.47	12.48	12.36	---	9.42
20	10.05	12.25	---	13.60	12.43	10.97	11.90	12.43	12.51	12.35	---	9.42
21	9.86	12.57	---	13.51	12.61	11.10	12.01	12.51	12.50	12.34	---	9.44
22	9.92	12.34	---	13.68	12.75	10.84	11.94	12.44	12.45	12.30	---	9.45
23	10.25	12.44	---	13.55	12.71	11.08	11.80	12.47	12.43	12.39	---	9.41
24	10.26	12.60	---	13.60	12.63	10.77	11.90	12.50	12.41	12.40	---	9.41
25	9.97	12.49	---	13.58	12.78	10.94	11.90	12.53	12.42	12.43	---	9.74
26	10.05	12.53	---	13.59	12.54	10.87	11.91	12.48	12.40	12.41	---	9.53
27	9.90	12.60	---	13.59	12.66	10.81	11.98	12.47	12.53	12.37	---	9.43
28	9.95	12.50	---	13.51	12.66	11.05	11.91	12.53	12.34	12.22	---	9.43
29	10.06	12.75	---	13.25	---	10.91	11.90	12.54	12.42	12.09	---	9.58
30	10.15	12.57	---	12.26	---	10.91	11.96	12.54	12.41	12.06	11.91	9.51
31	10.78	---	---	12.72	---	11.07	---	12.55	---	12.03	12.18	---
MEAN	10.08	12.04	---	---	12.28	11.21	11.80	12.18	12.45	12.35	---	9.88
MAX	10.78	12.75	---	---	12.78	12.60	12.14	12.55	12.53	12.49	---	12.05
MIN	9.60	10.81	---	---	11.79	10.68	10.81	11.80	12.34	12.03	---	9.19

06340900 MISSOURI RIVER NEAR HENSLER, ND

LOCATION.--Lat 47°16'45", long 101°11'03", in SW¼ sec.22, T.144 N., R.83 W., McLean County, Hydrologic Unit 10130101, on left bank about 7.5 mi west of Washburn, and at mile 1,362.

DRAINAGE AREA.--183,000 mi², approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 28 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 27.77 ft, Mar. 20, 1965; minimum daily recorded, 13.65 ft, June 4, 1986.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.61	15.50	16.83	17.67	17.07	16.81	15.33	16.26	16.84	16.73	16.30	16.09
2	14.49	15.66	16.65	17.46	17.15	16.79	15.36	16.31	16.76	16.76	16.31	16.17
3	14.42	15.97	16.71	17.52	17.50	16.67	15.13	16.41	16.77	16.82	16.29	16.24
4	14.31	16.12	16.78	17.59	16.80	16.37	15.33	16.39	16.79	16.73	16.18	16.03
5	14.63	15.95	16.69	17.69	16.54	16.30	15.85	16.24	16.79	16.75	16.10	15.35
6	14.44	16.13	16.69	17.69	16.17	15.73	16.20	16.46	16.73	16.69	16.08	14.39
7	14.48	16.08	16.81	17.62	16.15	15.74	16.28	16.21	16.81	16.80	16.13	14.16
8	14.44	16.09	16.72	17.74	16.00	15.58	16.27	16.30	16.77	16.67	16.19	14.08
9	14.45	16.02	16.52	17.77	16.41	15.60	16.31	16.25	16.77	16.68	16.20	13.91
10	14.43	16.17	16.31	17.66	16.45	15.37	16.42	16.48	16.74	16.68	16.17	13.79
11	14.36	16.01	16.31	17.67	16.30	15.38	16.03	16.29	16.78	16.74	16.17	14.03
12	14.73	16.08	16.50	17.71	16.12	15.16	16.49	16.29	16.76	16.68	16.17	13.99
13	14.38	16.30	---	17.08	16.16	15.22	16.24	16.44	16.75	16.65	16.23	13.74
14	14.84	16.15	---	17.26	16.14	15.28	16.35	16.25	16.77	16.66	16.17	13.73
15	14.77	16.78	---	17.78	16.28	15.32	16.24	16.26	16.82	16.62	16.15	13.85
16	14.20	16.69	---	17.68	16.37	15.08	16.28	16.26	16.79	16.60	16.19	13.79
17	14.37	16.89	---	17.64	16.28	15.12	16.39	16.17	16.86	16.61	16.20	13.83
18	14.50	16.82	---	17.63	16.43	15.13	16.21	16.47	16.81	16.62	16.22	13.81
19	14.33	16.64	---	17.70	16.49	15.24	16.32	16.78	16.84	16.60	16.16	13.82
20	14.48	16.54	---	17.69	16.66	15.29	16.25	16.73	16.84	16.60	16.17	13.84
21	14.30	16.73	---	17.60	16.81	15.40	16.39	16.81	16.84	16.57	16.17	13.85
22	14.36	16.62	---	17.74	16.93	15.19	16.28	16.74	16.81	16.53	16.20	13.85
23	14.52	16.74	19.61	17.65	16.88	15.42	16.11	16.78	16.77	16.60	16.17	13.86
24	14.77	16.83	19.87	17.65	16.87	15.14	16.29	16.80	16.76	16.62	16.26	13.85
25	14.41	16.70	19.50	17.67	16.91	15.25	16.31	16.86	16.76	16.63	16.16	14.19
26	14.49	16.76	18.87	17.67	16.79	15.16	16.18	16.83	16.74	16.65	16.14	13.95
27	14.39	16.80	18.52	17.68	16.82	15.21	16.43	16.79	16.85	16.60	16.18	13.90
28	14.35	16.77	17.92	17.51	16.89	15.30	16.31	16.81	16.71	16.51	16.33	13.89
29	14.53	16.88	17.68	17.64	---	15.29	16.26	16.83	16.77	16.33	16.23	13.99
30	14.47	16.77	17.67	16.53	---	15.22	16.30	16.84	16.74	16.28	16.15	13.93
31	15.24	---	17.63	17.24	---	15.37	---	16.84	---	16.29	16.36	---
MEAN	14.50	16.41	---	17.58	16.58	15.52	16.14	16.52	16.78	16.62	16.20	14.26
MAX	15.24	16.89	---	17.78	17.50	16.81	16.49	16.86	16.86	16.82	16.36	16.24
MIN	14.20	15.50	---	16.53	16.00	15.08	15.13	16.17	16.71	16.28	16.08	13.73

06341000 MISSOURI RIVER AT WASHBURN, ND

LOCATION.--Lat 47°17′20", long 101°02′15", in $SE^1/_4SW^1/_4$ sec.14, T.144 N., R.82 W., McLean County, Hydrologic Unit 10130101, on left bank near municipal water plant in Washburn, and at mile 1,355.

DRAINAGE AREA.--184,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 35 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 22.76 ft, Jan. 11, 1964; minimum daily recorded, 9.59 ft, Sept. 14, 1990.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.11	10.96	12.23	14.86	---	---	10.52	11.37	11.95	12.18	11.90	11.75
2	10.00	11.10	12.05	14.57	---	---	10.56	11.37	11.91	12.19	11.93	11.81
3	9.99	11.41	12.12	14.57	---	---	10.29	11.43	11.88	12.25	11.91	11.85
4	9.83	11.58	12.15	14.99	---	---	10.44	11.42	11.92	12.18	11.84	11.76
5	10.17	11.45	12.08	15.16	---	---	10.89	11.37	11.94	12.19	11.74	11.10
6	9.96	11.57	12.06	15.39	---	---	11.33	11.51	11.87	12.17	11.73	10.22
7	10.00	11.57	12.19	14.69	13.98	---	11.40	11.28	11.95	12.26	11.74	9.98
8	9.96	11.55	12.11	14.71	13.74	13.22	11.44	11.40	11.93	12.16	11.81	9.92
9	9.94	11.46	11.96	---	13.42	---	11.43	11.31	---	12.15	11.84	9.78
10	9.95	11.64	11.72	---	13.40	10.66	11.52	11.54	---	12.18	11.81	9.65
11	9.88	11.50	11.28	14.47	---	10.69	11.21	11.37	---	12.22	11.80	9.86
12	10.15	11.57	11.96	14.57	13.28	10.44	11.57	11.35	---	12.19	11.81	9.86
13	9.98	11.67	---	14.29	---	10.52	11.35	11.48	---	12.19	11.85	9.68
14	10.30	11.62	---	---	---	10.46	---	11.34	---	12.18	11.82	9.59
15	10.19	12.15	---	14.27	13.57	10.53	---	11.35	---	12.16	11.80	9.68
16	9.87	11.10	---	14.20	---	10.29	---	11.36	---	12.15	11.82	9.64
17	9.87	12.30	---	14.20	---	10.30	---	11.24	---	12.16	11.82	9.67
18	10.00	12.23	---	14.44	12.84	10.37	11.17	11.48	---	12.16	11.82	9.63
19	9.85	12.13	---	14.18	---	10.46	11.39	11.82	---	12.16	11.81	9.65
20	9.97	12.01	---	14.37	---	10.49	11.35	11.81	---	12.16	11.81	9.65
21	9.81	12.08	---	---	---	10.60	11.48	11.88	---	12.15	11.82	9.66
22	9.86	12.09	---	14.24	13.35	10.41	11.36	11.82	---	12.12	11.86	9.64
23	9.94	12.16	---	---	13.17	10.62	11.20	11.85	---	12.16	11.81	9.68
24	10.31	12.26	14.76	14.31	13.25	10.39	11.37	11.87	---	12.19	11.90	9.63
25	9.91	12.13	14.26	---	13.52	10.44	11.41	11.92	---	12.20	11.79	9.80
26	9.98	12.16	14.82	---	13.07	10.37	11.21	11.93	---	12.24	11.78	9.68
27	9.97	12.17	15.30	---	---	10.44	11.50	11.87	---	12.18	11.80	9.68
28	9.81	12.22	14.88	---	---	10.45	11.39	11.90	---	12.13	11.94	9.64
29	10.01	12.26	15.18	---	---	10.53	11.35	11.91	12.21	11.93	11.90	9.73
30	9.88	12.18	15.21	---	---	10.42	11.37	11.96	12.18	11.90	11.82	9.69
31	10.62	---	14.66	---	---	10.54	---	11.97	---	11.94	11.94	---
MEAN	10.00	11.81	---	---	---	---	---	11.60	---	12.15	11.83	10.05
MAX	10.62	12.30	---	---	---	---	---	11.97	---	12.26	11.94	11.85
MIN	9.81	10.96	---	---	---	---	---	11.24	---	11.90	11.73	9.59

06341410 TURTLE CREEK ABOVE WASHBURN, ND

LOCATION.--Lat 47°23'06", long 100°54'43", in NW¼NE¼NE¼ sec.18, T.145 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 250 ft downstream from bridge on county highway, 8.5 mi northeast of Washburn, and 8.8 mi south of Turtle Lake.

DRAINAGE AREA.--350 mi², approximately, of which 195 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,780 ft from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1 to Nov. 26, Feb. 13 to Mar. 19, Mar. 23-26, Apr. 2, and Apr. 24 to June 15. Records fair except those for periods of estimated daily discharges, which are poor. Water from the McClusky Canal is sometimes diverted into the stream at a point upstream from the gage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 845 ft³/s, Mar. 21, 1987, gage height, 6.94 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 129 ft³/s, July 26, gage height, 3.90 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.10	e.07	.00	.00	.00	e.00	.11	e.15	e.20	.39	.97	.29
2	e.10	e.07	.00	.00	.00	e.00	e.10	e.13	e1.0	.23	.14	2.2
3	e.09	e.07	.00	.00	.00	e.00	.25	e.12	e1.5	.21	.07	2.6
4	e.09	e.08	.00	.00	.00	e.00	1.8	e.10	e1.2	.17	.06	3.0
5	e.10	e.08	.00	.00	.00	e.00	1.5	e.10	e1.0	.15	.05	3.9
6	e.09	e.08	.00	.00	.00	e.00	1.1	e.09	e.50	.14	.04	4.9
7	e.08	e.08	.00	.00	.00	e.00	.43	e.08	e.30	.23	.03	4.3
8	e.09	e.08	.00	.00	.00	e.01	.19	e.07	e1.0	.18	.01	4.1
9	e.09	e.08	.00	.00	.00	e.02	.11	e.06	e4.0	.56	.00	3.6
10	e.10	e.08	.00	.00	.00	e.05	.19	e.05	e3.5	3.2	.00	3.4
11	e.11	e.08	.00	.00	.00	e1.0	.18	e.05	e1.5	3.1	.00	3.6
12	e.10	e.07	.00	.00	.00	e.80	.14	e.04	e.80	1.7	.00	3.5
13	e.10	e.07	.00	.00	e.00	e.20	.11	e.03	e.35	.80	.00	3.5
14	e.10	e.06	.00	.00	e.00	e.17	.12	e.02	e.20	.37	.00	3.6
15	e.09	e.04	.00	.00	e.00	e.15	.09	e.02	e.25	.20	.00	3.4
16	e.09	e.02	.00	.00	e.00	e.25	.11	e.08	2.2	.17	.00	3.5
17	e.08	e.02	.00	.00	e.00	e.35	.26	e.07	3.2	.14	.00	3.4
18	e.08	e.02	.00	.00	e.00	e.20	.29	e.05	1.9	.12	.00	3.3
19	e.08	e.03	.00	.00	e.00	e.30	.18	e.04	1.7	.11	.00	3.4
20	e.08	e.02	.00	.00	e.00	.87	.10	e.04	1.2	.11	.00	5.6
21	e.08	e.02	.00	.00	e.00	.68	.13	e.04	.95	.10	.00	5.5
22	e.09	e.02	.00	.00	e.00	.20	.11	e.03	.76	.10	.00	4.9
23	e.09	e.01	.00	.00	e.00	e.18	.10	e.03	.67	.09	.00	4.6
24	e.10	e.01	.00	.00	e.00	e.15	e.10	e.04	1.3	.07	.00	4.8
25	e.10	e.01	.00	.00	e.00	e.17	e.10	e.05	1.6	19	.00	4.5
26	e.11	e.01	.00	.00	e.00	e.20	e.09	e2.5	.52	90	.00	4.3
27	e.10	.00	.00	.00	e.00	.27	e.09	e2.1	.60	55	.00	3.8
28	e.09	.00	.00	.00	e.00	.16	e.09	e1.7	.47	24	.00	3.4
29	e.09	.00	.00	.00	---	.16	e.09	e1.5	.41	13	.00	3.9
30	e.08	.00	.00	.00	---	.12	e.10	e1.0	.23	6.1	.00	4.3
31	e.07	---	.00	.00	---	.11	---	e.50	---	2.5	.00	---
TOTAL	2.84	1.28	0.00	0.00	0.00	6.77	8.36	10.88	35.01	222.24	1.37	113.09
MEAN	.092	.043	.000	.000	.000	.22	.28	.35	1.17	7.17	.044	3.77
MAX	.11	.08	.00	.00	.00	1.0	1.8	2.5	4.0	90	.97	5.6
MIN	.07	.00	.00	.00	.00	.00	.09	.02	.20	.07	.00	.29
AC-FT	5.6	2.5	.00	.00	.00	13	17	22	69	441	2.7	224

CAL YR 1989 TOTAL 482.98 MEAN 1.32 MAX 18 MIN .00 AC-FT 958
WTR YR 1990 TOTAL 401.84 MEAN 1.10 MAX 90 MIN .00 AC-FT 797

e Estimated

06341410 TURTLE CREEK ABOVE WASHBURN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1987 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT										
03...	1225	0.09	1270	--	8.1	11.0	8.0	12	7.2	60
MAR										
12...	1303	0.83	--	1180	--	7.5	1.5	--	--	--
21...	1250	1.3	--	1090	8.3	5.0	2.5	3.0	10.8	80
APR										
04...	1026	1.0	--	1290	8.5	5.0	3.5	5.3	9.1	69
MAY										
23...	1140	0.03	--	2440	8.6	23.5	17.0	7.5	8.6	90
JUN										
25...	1114	1.8	--	2010	8.5	29.5	24.0	4.5	4.0	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT										
03...	320	42	52	170	53	4	9.5	336	330	17
MAR										
21...	220	29	36	170	61	5	11	371	210	10
APR										
04...	280	35	46	200	60	5	13	456	210	18
MAY										
23...	500	55	88	440	65	9	14	922	540	22
JUN										
25...	360	36	66	350	67	8	15	695	450	15

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT										
03...	0.60	7.4	839	831	1.14	0.20	<0.100	0.070	340	32
MAR										
21...	0.30	14	730	703	0.99	2.52	<0.100	0.120	260	64
APR										
04...	0.20	16	868	812	1.18	2.34	<0.100	0.080	320	90
MAY										
23...	0.40	19	1790	1730	2.43	0.14	--	--	720	70
JUN										
25...	0.70	6.9	1420	1360	1.93	6.86	<0.100	0.260	880	100

06341800 PAINTED WOODS CREEK NEAR WILTON, ND

LOCATION.--Lat 47°16'30", long 100°47'30", in $SW^1/_4SW^1/_4$ sec.23, T.144 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 600 ft upstream from county highway bridge, 7 mi upstream from Yanktonai Creek, and 8 mi north of Wilton.

DRAINAGE AREA.--427 mi^2, approximately, of which about 310 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1957 to September 1981, August 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,760 ft, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 8 to Mar. 11, Mar. 18, 22. Records good except those for periods of estimated daily discharges, which are poor. Since the fall of 1982 Missouri River basin water has been diverted into the stream at a point several miles upstream.

AVERAGE DISCHARGE.--8 years (1983-90), 29.5 ft^3/s, 21,370 acre-ft/yr; 24 years prior to the diversion of Missouri River water into the basin, (1958-81), 8.07 ft^3/s, 5,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,050 ft^3/s, Apr. 19, 1979, gage height, 9.64 ft; no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62 ft^3/s, Mar. 17, gage height, 4.85 ft; minimum daily discharge, 0.33 ft^3/s, Aug. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	34	35	e27	e23	e30	37	1.7	.66	2.1	.48	22
2	27	32	30	e26	e24	e28	36	1.6	.94	2.5	.42	22
3	23	30	28	e25	e27	e31	33	1.4	1.5	4.8	.33	22
4	23	36	37	e25	e32	e30	34	1.3	1.9	3.5	12	23
5	24	36	36	e27	e31	e28	34	1.1	1.9	3.2	19	23
6	25	36	33	e30	e30	e27	31	.99	1.5	3.0	19	23
7	27	36	28	e33	e30	e27	28	.89	1.3	2.3	17	23
8	28	36	e27	e34	e29	e27	26	.75	1.3	2.0	17	23
9	27	35	e27	e34	e28	e28	25	.74	1.3	1.7	14	28
10	28	35	e26	e37	e28	e30	23	.74	1.3	1.5	19	23
11	26	35	e25	e35	e29	e35	12	.80	1.1	1.5	21	20
12	26	35	e25	e34	e29	43	7.0	.79	1.2	1.5	21	20
13	27	34	e23	e30	e28	43	5.3	.69	1.6	1.3	20	21
14	30	34	e20	e32	e27	34	4.1	.63	1.3	1.2	19	22
15	30	32	e21	e31	e26	31	3.1	.79	1.3	1.0	19	22
16	31	26	e21	e30	e24	19	3.3	.99	1.3	.83	15	22
17	30	29	e20	e30	e23	46	2.8	1.3	3.5	.77	20	22
18	30	30	e19	e29	e24	e40	2.6	1.6	2.6	.63	22	23
19	29	34	e18	e28	e25	39	1.9	1.8	2.9	.60	22	25
20	30	39	e17	e30	e27	38	1.7	1.6	7.0	.71	22	30
21	30	37	e18	e32	e28	32	1.8	1.3	6.0	.71	22	28
22	30	31	e19	e32	e29	e33	1.7	1.0	6.2	.66	22	26
23	30	31	e20	e30	e28	23	1.6	.82	4.3	.65	22	25
24	30	32	e22	e30	e27	42	1.5	.80	3.2	.66	26	24
25	30	34	e24	e31	e26	33	1.9	.76	2.5	.84	22	25
26	31	35	e26	e33	e27	37	1.9	1.5	2.0	.85	17	25
27	30	31	e28	e32	e27	36	1.9	1.4	2.2	.79	22	26
28	32	23	e27	e30	e26	34	1.8	1.1	2.6	.68	22	27
29	34	38	e26	e32	---	30	1.7	1.0	2.5	.62	21	28
30	33	34	e25	e30	---	28	1.6	.90	2.1	.60	22	27
31	33	---	e25	e28	---	30	---	.79	---	.56	21	---
TOTAL	891	1000	776	947	762	1012	368.2	33.57	71.00	44.26	558.23	720
MEAN	28.7	33.3	25.0	30.5	27.2	32.6	12.3	1.08	2.37	1.43	18.0	24.0
MAX	34	39	37	37	32	46	37	1.8	7.0	4.8	26	30
MIN	23	23	17	25	23	19	1.5	.63	.66	.56	.33	20
AC-FT	1770	1980	1540	1880	1510	2010	730	67	141	88	1110	1430

CAL YR 1989 TOTAL 9101.9 MEAN 24.9 MAX 70 MIN 1.4 AC-FT 18050
WTR YR 1990 TOTAL 7183.26 MEAN 19.7 MAX 46 MIN .33 AC-FT 14250

e Estimated

06341800 PAINTED WOODS CREEK NEAR WILTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-64, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT										
03...	1443	22	1270	8.3	11.0	9.0	1.0	12.0	103	360
NOV										
27...	1120	30	1260	8.4	-7.5	0.5	0.80	12.8	89	340
JAN										
08...	1044	34	1330	--	3.5	0.0	--	--	--	--
FEB										
12...	1104	29	1350	--	1.0	0.0	--	--	--	--
MAR										
12...	1425	46	890	--	6.5	0.5	--	--	--	--
APR										
02...	1356	36	1220	8.4	6.0	7.0	0.70	10.8	88	340
MAY										
24...	1050	0.84	1770	8.5	21.0	19.0	17	9.3	101	440
JUN										
25...	1339	2.6	1810	8.5	28.5	24.0	12	5.5	66	420
AUG										
22...	1429	22	1340	8.4	32.5	25.0	6.5	7.0	86	380

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
OCT										
03...	47	60	160	48	4	13	248	440	17	0.50
NOV										
27...	48	53	150	48	4	11	250	400	19	0.60
JAN										
08...	--	--	--	--	--	--	--	--	--	--
MAR										
12...	--	--	--	--	--	--	--	--	--	--
APR										
02...	52	52	140	46	3	13	248	310	18	0.40
MAY										
24...	66	66	260	56	5	12	452	670	15	0.40
JUN										
25...	50	71	260	57	6	14	399	570	21	0.20
AUG										
22...	50	62	160	47	4	14	264	390	20	0.60

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT									
03...	1.3	899	888	1.22	52.9	<0.100	<0.010	310	12
NOV									
27...	1.8	847	834	1.15	67.9	<0.100	<0.010	390	10
JAN									
08...	--	--	--	--	--	--	--	--	--
MAR									
12...	--	--	--	--	--	--	--	--	--
APR									
02...	2.1	856	736	1.16	82.7	<0.100	<0.010	290	9
MAY									
24...	9.3	1230	1370	1.67	2.79	--	--	440	7
JUN									
25...	4.5	1300	1230	1.77	9.06	<0.100	0.040	470	13
AUG									
22...	9.0	930	864	1.26	54.5	<0.100	<0.010	330	11

06342020 MISSOURI RIVER AT PRICE, ND

LOCATION.--Lat 47°04'47", long 100°55'55", in NW¼ sec.34, T.142 N., R.81 W., Oliver County, Hydrologic Unit 10130101, on right bank 0.5 mi south of Price, and at mile 1,338.

DRAINAGE AREA.--185,000 mi², approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,620.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 20 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 52 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 30.12 ft, Jan. 22, 1967; minimum daily recorded, 17.68 ft, Apr. 22, 1987.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.36	19.04	20.43	24.97	21.45	---	---	19.80	20.32	20.31	19.97	19.91
2	18.28	19.14	20.29	24.91	20.55	---	---	19.75	20.34	20.28	20.00	19.88
3	18.26	19.40	20.31	24.92	21.09	---	---	19.79	20.26	20.33	19.98	19.91
4	18.16	19.64	20.33	24.91	21.32	---	---	19.81	20.27	20.29	19.95	19.94
5	18.35	19.60	20.32	24.94	20.57	---	---	19.84	20.31	20.26	19.83	19.53
6	18.26	19.59	20.29	24.89	---	---	---	19.82	20.25	20.25	19.81	18.86
7	18.26	19.66	20.36	24.78	---	---	---	19.79	20.27	20.32	19.81	18.40
8	18.25	19.64	20.36	24.59	---	---	---	19.78	20.32	20.28	19.87	18.29
9	18.24	19.57	20.29	24.09	---	---	---	19.74	20.26	20.23	19.87	18.18
10	18.22	19.68	20.06	23.17	---	---	19.85	19.86	20.27	20.27	19.86	17.97
11	18.20	19.65	20.08	22.50	---	---	19.77	19.83	20.29	20.29	19.84	18.11
12	18.23	19.61	20.49	24.32	---	---	19.78	19.76	20.28	20.26	19.84	18.16
13	18.42	19.63	20.60	25.90	---	---	19.82	19.86	20.27	20.25	19.84	18.02
14	18.34	19.79	20.79	24.56	---	---	19.85	19.80	20.26	20.24	19.87	17.84
15	18.43	20.02	22.88	23.09	---	---	19.80	19.78	20.28	20.24	19.84	17.91
16	18.41	20.25	23.91	22.03	---	---	19.80	19.82	20.29	20.21	19.85	17.89
17	18.07	20.33	24.34	21.65	---	---	19.85	19.71	20.34	20.23	19.87	17.89
18	18.23	20.30	23.39	21.44	---	---	19.82	19.79	20.31	20.21	19.84	17.88
19	18.20	20.33	21.87	21.47	---	---	19.80	20.12	20.37	20.22	19.87	17.88
20	18.20	20.16	24.43	21.37	---	---	19.80	20.17	20.32	20.22	19.84	17.88
21	18.17	20.08	21.85	21.35	---	---	19.85	20.21	20.33	20.20	19.86	17.88
22	18.13	20.25	22.45	21.27	---	---	19.81	20.21	20.32	20.19	19.88	17.86
23	18.15	20.24	25.12	21.27	---	---	19.73	20.19	20.30	20.17	19.85	17.89
24	18.52	20.38	25.37	21.15	---	---	19.77	20.19	20.29	20.21	19.89	17.86
25	18.29	20.33	25.40	21.21	---	---	19.81	20.25	20.28	20.22	19.89	17.89
26	18.24	20.33	25.25	21.20	---	---	19.70	20.31	20.29	20.26	19.86	17.97
27	18.27	20.30	25.19	21.14	---	---	19.85	20.25	20.34	20.23	19.86	17.90
28	18.11	20.40	25.24	21.05	---	---	19.81	20.26	20.33	20.21	19.97	17.86
29	18.22	20.40	25.01	21.20	---	---	19.76	20.26	20.33	20.04	19.98	17.89
30	18.14	20.41	24.91	20.38	---	---	19.77	20.30	20.28	20.00	19.89	17.91
31	18.62	---	25.08	20.70	---	---	---	20.32	---	20.00	19.93	---
MEAN	18.27	19.94	22.47	22.79	---	---	---	19.98	20.30	20.22	19.88	18.31
MAX	18.62	20.41	25.40	25.90	---	---	---	20.32	20.37	20.33	20.00	19.94
MIN	18.07	19.04	20.06	20.38	---	---	---	19.71	20.25	20.00	19.81	17.84

06342260 SQUARE BUTTE CREEK BELOW CENTER, ND

LOCATION.--Lat 47°03'25", long 101°11'35", in SE¼ sec.4, T.141 N., R.83 W., Oliver County, Hydrologic Unit 10130101, on right bank at southeast corner of farmyard, and 6 mi southeast of Center.

DRAINAGE AREA.--146 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,865 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1 to Sept. 30. Records fair. Flow regulated by Nelson Lake 1.5 miles upstream beginning Aug. 24, 1967, capacity 5,000 acre-ft. The capacity of Nelson Lake was increased to 10,000 acre-ft in Aug. 1975.

AVERAGE DISCHARGE.--25 years, 10.9 ft³/s, 7,900 acre-ft/yr; median of yearly mean discharges, 8.9 ft³/s, 6,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft³/s, June 24, 1966, gage height, 14.35 ft; no flow Feb. 14-26, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 180 ft³/s, Sept. 5, gage height, 4.45 ft; backwater from beaver dam; minimum daily, 0.40 ft³/s, Dec. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.2	e1.0	e1.1	e1.0	e.50	e.90	e1.9	e1.6	e1.7	e2.1	e1.4	e1.1
2	e1.2	e.90	e1.1	e1.0	e.55	e.90	e1.7	e1.4	e2.3	e1.5	e1.5	e1.0
3	e1.0	e1.0	e1.1	e.95	e.60	e1.0	e1.6	e1.5	e1.4	e1.4	e1.6	e6.0
4	e.90	e1.1	e1.0	e1.0	e.70	e1.0	e1.7	e1.4	e1.3	e1.3	e1.5	e2.5
5	e1.1	e1.1	e1.0	e1.1	e.80	e1.1	e1.6	e1.3	e1.3	e1.3	e1.5	e30
6	e1.1	e1.1	e1.0	e1.1	e.80	e1.1	e1.5	e1.2	e1.4	e1.3	e1.5	e2.4
7	e1.0	e1.0	e.95	e1.1	e.80	e1.2	e1.4	e1.1	e1.6	e2.0	e1.5	e2.0
8	e.95	e1.0	e.95	e1.1	e.78	e1.4	e1.5	e1.1	e1.5	e1.5	e1.5	e2.0
9	e.90	e1.1	e.90	e1.1	e.78	e1.3	e1.7	e1.1	e1.4	e1.4	e1.5	e2.1
10	e1.0	e1.1	e.85	e1.2	e.75	e1.5	e1.6	e1.1	e1.2	e1.8	e1.4	e1.9
11	e1.2	e1.0	e.80	e1.1	e.74	e1.7	e1.5	e1.1	e1.3	e2.5	e1.4	e2.1
12	e1.2	e1.0	e.75	e1.0	e.72	e1.6	e1.5	e1.1	e1.5	e1.6	e1.4	e1.6
13	e1.1	e1.0	e.70	e1.0	e.65	e1.4	e1.5	e1.0	e1.3	e1.8	e1.7	e1.7
14	e1.1	e.95	e.60	e1.1	e.60	e1.4	e1.5	e1.0	e1.5	e1.6	e1.6	e1.9
15	e1.0	e.80	e.60	e1.0	e.50	e1.4	e1.5	e1.0	e2.0	e1.4	e1.5	e1.8
16	e.95	e.75	e.55	e1.0	e.52	e1.4	e1.7	e1.0	e1.5	e1.5	e1.4	e1.8
17	e.90	e.85	e.50	e.95	e.55	e1.5	e1.6	e1.0	e1.6	e1.4	e1.6	e1.9
18	e.90	e.90	e.45	e.95	e.60	e1.9	e1.6	e1.0	e2.1	e1.5	e1.5	e1.8
19	e.95	e1.0	e.40	e.90	e.65	e2.0	e1.5	e1.1	e2.2	e1.5	e1.5	e1.8
20	e1.0	e1.1	e.45	e.80	e.70	e2.2	e1.5	e1.0	e1.6	e1.7	e1.6	e2.0
21	e1.1	e1.0	e.45	e.80	e.70	e2.2	e1.4	e1.0	e1.6	e1.5	e1.4	e1.7
22	e1.1	e.95	e.45	e.85	e.68	e2.0	e1.4	e1.0	e1.5	e1.5	e1.3	e1.6
23	e1.1	e.90	e.50	e.90	e.65	e1.8	e1.3	e1.0	e1.5	e1.5	e1.2	e1.5
24	e1.1	e.95	e.60	e.90	e.60	e2.0	e1.5	e1.1	e1.4	e1.5	e1.5	e1.5
25	e1.2	e1.0	e.70	e.95	e.70	e2.1	e2.0	e1.4	e1.5	e1.4	e1.5	e1.6
26	e1.2	e1.0	e.80	e1.0	e.75	e2.2	e1.7	e1.8	e1.4	e1.3	e1.4	e1.7
27	e1.2	e.95	e1.0	e1.0	e.70	e2.2	e1.6	e1.3	e1.5	e1.2	e1.3	e1.7
28	e1.2	e.90	e1.0	e1.0	e.75	e2.3	e1.5	e1.3	e2.5	e1.2	e1.3	e2.0
29	e1.3	e.90	e.95	e.90	---	e2.2	e1.5	e1.2	e1.5	e1.3	e1.2	e2.1
30	e1.2	e1.1	e.90	e.80	---	e1.9	e1.4	e1.2	e1.5	e1.4	e1.2	e1.6
31	e1.1	---	e.95	e.60	---	e2.0	---	e1.5	---	e1.4	e1.1	---
TOTAL	33.45	29.40	24.05	30.15	18.82	50.80	46.9	36.9	47.6	47.3	44.5	86.4
MEAN	1.08	.98	.78	.97	.67	1.64	1.56	1.19	1.59	1.53	1.44	2.88
MAX	1.3	1.1	1.1	1.2	.80	2.3	2.0	1.8	2.5	2.5	1.7	30
MIN	.90	.75	.40	.60	.50	.90	1.3	1.0	1.2	1.2	1.1	1.0
AC-FT	66	58	48	60	37	101	93	73	94	94	88	171

CAL YR 1989 TOTAL 383.19 MEAN 1.05 MAX 3.0 MIN .40 AC-FT 760
WTR YR 1990 TOTAL 496.27 MEAN 1.36 MAX 30 MIN .40 AC-FT 984

e Estimated

06342260 SQUARE BUTTE CREEK BELOW CENTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
02...	1153	1.2	1390	--	8.5	10.5	--	--	--	--	--	--
NOV												
30...	1208	1.1	1500	--	5.5	2.5	--	--	--	--	--	--
JAN												
05...	1004	1.0	1550	--	-6.0	1.5	--	--	--	--	--	--
FEB												
12...	1400	0.72	1530	--	1.0	4.0	--	--	--	--	--	--
MAR												
12...	1002	1.5	1310	--	6.5	5.0	--	--	--	--	--	--
APR												
02...	1019	1.6	1460	8.1	5.0	8.5	390	88	41	200	52	4
MAY												
30...	1013	1.1	1530	--	25.0	19.0	--	--	--	--	--	--
JUN												
26...	1115	1.4	1550	--	35.5	23.0	--	--	--	--	--	--
AUG												
20...	1105	1.6	1570	8.0	24.0	20.0	400	90	43	240	56	5

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	8.4	480	0	391	400	16	0.40	19	1020	1010	1.39
AUG											
20...	7.7	500	0	412	540	26	0.40	21	1290	1220	1.75

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
02...	4.46	2	990	10	<1	41	320	0.2	2	<1	1100
AUG											
20...	5.47	2	960	80	<1	42	50	0.1	<1	1	1100

06342450 BURNT CREEK NEAR BISMARCK, ND

LOCATION.--Lat 46°54'54", long 100°48'48", in $SW^1/_4NW^1/_4SW^1/_4$ sec.29, T.140 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank on upstream side of county highway bridge, and 7 mi northwest of Bismarck.

DRAINAGE AREA.--108 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1967 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Altitude of gage is 1,690 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--15 years (water years 1968-82), 8.03 ft^3/s, 5,820 acre-ft/yr; median of yearly mean discharges, 4.7 ft^3/s, 3,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft^3/s, Apr. 18, 1979, gage height, 16.93 ft from rating curve extended above 2,200 ft^3/s on basis of culvert and flow-over-road measurement of peak flow; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 3.0 ft^3/s, July 12, gage height, 4.29 ft; no flow for months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
2	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
3	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
4	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
5	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
6	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
7	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
8	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
9	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	.00	.00	.00	1.5	.00	.00
13	---	---	---	---	---	.00	.00	.00	.00	.72	.00	.00
14	---	---	---	---	---	.00	.00	.00	.00	.26	.00	.00
15	---	---	---	---	---	.00	.00	.00	.00	.06	.00	.00
16	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	0.00	0.00	0.00	0.00	2.54	0.00	0.00
MEAN	---	---	---	---	---	.000	.000	.000	.000	.082	.000	.000
MAX	---	---	---	---	---	.00	.00	.00	.00	1.5	.00	.00
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.00	.00	.00	.00	5.0	.00	.00

06342500 MISSOURI RIVER AT BISMARCK, ND

LOCATION.--Lat 46°48'51", long 100°49'12", in $SE^1/_4NW^1/_4SE^1/_4$ sec.31, T.139 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank 40 ft upstream from Bismarck City waterplant, 2,100 ft downstream from Burlington Northern Railway bridge, 1.6 mi northwest of Bismarck Post Office, 3.5 mi upstream from Heart River, and at mile 1,314.5

DRAINAGE AREA.--186,400 mi^2, approximately.

WATER-DISCHARGE RECORDS

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 1,618.28 ft, revised, above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1937.

REMARKS.--Estimated daily discharges: Dec. 11 to Feb. 28. Records good except those for period of estimated daily discharges, which are fair. Flow regulated by Lake Sakakawea (station 06338000) 75.4 mi upstream since November 1953.

AVERAGE DISCHARGE.--62 years (water years 1929-90), 22,580 ft^3/s, 16,360,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 500,000 ft^3/s, Apr. 6, 1952, gage height, 27.90 ft. Since completion of Garrison Dam in 1953, maximum discharge, 68,900 ft^3/s, July 13, 1975, gage height, 14.24 ft; maximum gage height, 14.58 ft, Dec, 18, 1979, backwater from ice; minimum discharge, about 1,800 ft^3/s, Jan. 3, 1940; minimum gage height, 1.35 ft, Sept. 4, 1934, present site and datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 31.6 ft, Mar. 31, 1881, present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 28,000 ft^3/s, Jan. 25, gage height, 9.91 ft, backwater from ice; maximum gage height, 13.30 ft, Feb. 5, backwater from ice; minimum daily discharge, 10,400 ft^3/s, Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11800	14400	22800	e24000	e22000	25100	16200	19800	22500	22200	20100	20300
2	11900	15400	22700	e24500	e21500	24300	16100	19400	22800	22000	20200	19400
3	11800	16400	22100	e25000	e21500	24000	16000	19500	22300	22200	20200	19700
4	11500	17800	22300	e25500	e22500	23300	15400	19800	21900	22300	20100	20100
5	11500	18400	22400	e26000	e23000	21600	16100	19900	22200	22000	19500	19000
6	12100	17900	22200	e26000	e21000	20500	18000	19400	22100	21800	19200	15800
7	11600	18600	22200	e26500	e19000	18700	19300	20000	21900	22000	19100	12700
8	11700	18600	23300	e27000	e20000	18400	19800	19200	22400	22300	19400	12000
9	11600	18500	22600	e27000	e21000	17900	19900	19300	22000	21700	19600	11800
10	11500	18500	21300	e27000	e22000	17700	20000	19300	21800	21900	19700	11100
11	11500	18900	e19000	e26500	e21500	17100	20400	20100	21900	22200	19500	11000
12	11300	18400	e17000	e25000	e19500	16900	19200	19300	22000	22000	19500	11700
13	12400	18500	e16000	e24000	e19000	16400	20300	19400	21900	21800	19500	11300
14	11600	19500	e17000	e25000	e19000	16400	19800	19800	21800	21800	19800	10400
15	12600	19700	e18000	e26000	e19500	16600	20000	19300	22000	21800	19500	10700
16	12500	22200	e19500	e27000	e20000	16600	19600	19700	22100	21600	19400	10800
17	10900	22400	e20500	e27000	e21000	15800	19700	19300	22200	21700	19700	10700
18	11200	22800	e21000	e27000	e21500	15900	20100	18800	22300	21600	19600	10900
19	11600	22700	e21000	e27000	e22000	15900	19500	20400	22500	21600	19800	10700
20	11200	21900	e21000	e27000	e22000	16200	19600	21700	22300	21700	19600	10900
21	11400	21200	e20000	e27000	e21500	16300	19500	21800	22300	21600	19600	10900
22	10900	21900	e19000	e27000	e23000	16600	19800	22100	22300	21600	19700	10900
23	11000	21900	e22000	e27500	e23500	16100	19400	21800	22100	21400	19700	10800
24	11900	22400	e22000	e27000	e25000	16600	19000	21900	21900	21600	19900	10800
25	12400	22700	e22000	e27700	e26000	15900	19600	22000	21900	21700	20300	10700
26	11400	22300	e22500	e26500	e25500	16000	19500	22500	22100	21900	19500	11500
27	11700	22200	e22500	e26500	e25500	15800	19200	22300	22100	22000	19600	11000
28	11300	22600	e23000	e26500	e25500	15700	20000	22000	22600	21800	19900	10800
29	11100	22800	e23000	e25000	---	16100	19600	22000	22200	21200	20500	10800
30	11500	22900	e23500	e24000	---	16100	19600	22100	22200	20300	19900	11100
31	12000	---	e24000	e22000	---	15900	---	22300	---	20100	19600	---
TOTAL	360400	604400	657400	806700	614000	552400	570200	636200	664600	673400	611200	380300
MEAN	11630	20150	21210	26020	21930	17820	19010	20520	22150	21720	19720	12680
MAX	12600	22900	24000	27700	26000	25100	20400	22500	22800	22300	20500	20300
MIN	10900	14400	16000	22000	19000	15700	15400	18800	21800	20100	19100	10400
AC-FT	714900	1199000	1304000	1600000	1218000	1096000	1131000	1262000	1318000	1336000	1212000	754300

CAL YR 1989 TOTAL 7394300 MEAN 20260 MAX 26200 MIN 10900 AC-FT 14670000
WTR YR 1990 TOTAL 7131200 MEAN 19540 MAX 27700 MIN 10400 AC-FT 14140000

e Estimated

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND

LOCATION.--Lat 46°52'11", long 102°49'37", in $NE^{1}/_{4}NW^{1}/_{4}SW^{1}/_{4}$ sec.8, T.139 N., R.96 W., Stark County, Hydrologic Unit 10130202, at left edge of spillway, and 2 mi southwest of Dickinson.

DRAINAGE AREA.--400 mi^2, approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

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 National Geodetic Vertical Datum of 1929 (levels by Water and Power Resources Service); gage readings have been reduced to elevations NGVD. Prior to Jan. 4, 1961, nonrecording gage at same site and datum.

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 9,100 acre-ft between elevations, 2,404.0 ft and 2,420.0 ft, crest of spillway. The crest of the spillway was raised 3.5 ft in 1981 from 2,416.5 ft. Figures given herein represent total contents based on capacity table dated Jan. 1, 1965. The reservoir is for flood control, irrigation, and municipal supply.

COOPERATION.--Record of elevation and contents furnished by U.S. Bureau of Reclamation. Monthend elevations interpolated from once-daily readings. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 11,590 acre-ft, June 9, 1982, elevation, 2,421.13 ft; minimum since initial filling of reservoir, 2,950 acre-ft, Mar. 16, 1962, elevation, 2,410.41 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents recorded, 7,000 acre-ft, Oct. 1, elevation, 2,416.90 ft; minimum, 5,380 acre-ft, Sept. 30, elevation 2,414.76 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,416.90	7,000	--
Oct. 31	2,416.40	6,590	-410
Nov. 30	2,416.36	6,560	-30
Dec. 31	2,416.24	6,460	-100
CAL YR 1989	--	--	+1,670
Jan. 31	2,416.18	6,410	-50
Feb. 28	2,416.07	6,320	-90
Mar. 31	2,416.16	6,400	+80
Apr. 30	2,416.00	6,270	-130
May 31	2,415.62	5,990	-280
June 30	2,415.72	6,060	+70
July 31	2,416.44	6,630	+570
Aug. 31	2,415.62	5,990	-640
Sept. 30	2,414.75	5,380	-610
WTR YR 1990	--	--	-1,620

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1975, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	RESERVOIR DEPTH (FEET) (72025)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT										
12...	1415	23.0	693	1460	8.7	18.0	11.0	65	24.0	10.4
JAN										
08...	1140	23.5	694	1810	8.3	3.0	3.0	30	171	7.4
APR										
12...	1000	24.0	699	1600	8.4	0.0	5.5	35	16.0	13.7
JUL										
05...	1055	24.0	701	1650	8.5	20.0	23.0	25	46.0	6.0

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
OCT										
12...	104	260	53	30	230	65	6	11	270	500
JAN										
08...	61	310	63	37	290	66	7	13	338	600
APR										
12...	119	260	53	32	250	66	7	11	302	500
JUL										
05...	77	270	55	33	270	67	7	12	316	560

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT									
12...	11	0.40	7.2	1030	1000	1.40	<0.100	0.080	310
JAN									
08...	15	0.40	4.8	1260	1230	1.71	0.160	0.080	370
APR									
12...	14	0.30	4.5	1120	1050	1.52	<0.100	0.050	330
JUL									
05...	15	0.40	1.6	1170	1140	1.59	<0.100	0.060	340

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT							
12...	1405	0.0	11.0	--	1500	8.6	10.7
12...	1410	1.60	11.0	--	1470	8.6	10.5
12...	1415	3.30	11.0	18.0	1460	8.7	10.4
12...	1417	6.60	11.0	--	1490	8.7	10.2
12...	1420	13.1	11.0	--	1490	8.7	10.0
12...	1425	19.7	11.0	--	1480	8.7	10.0
JAN							
08...	1135	0.0	0.0	--	1720	8.3	8.2
08...	1138	1.60	2.0	--	1820	8.3	7.5
08...	1140	3.30	3.0	3.0	1810	8.3	7.4
08...	1142	6.60	2.5	--	1800	8.3	7.9
08...	1145	13.1	2.0	--	1820	8.3	9.7
08...	1147	19.7	2.5	--	1910	8.3	6.4
08...	1150	23.5	3.0	--	2020	8.2	1.0
APR							
12...	0955	0.0	6.0	--	1580	8.3	13.6
12...	0957	1.60	6.0	--	1610	8.4	13.4
12...	1000	3.30	5.5	0.0	1600	8.4	13.7
12...	1002	6.60	5.0	--	1620	8.5	14.0
12...	1005	13.1	5.0	--	1570	8.4	14.4
12...	1007	19.7	5.0	--	1580	8.5	14.3
12...	1010	24.0	5.0	--	1570	8.5	14.3
JUL							
05...	1050	0.0	23.0	--	1660	8.4	6.1
05...	1052	1.60	23.0	--	1640	8.5	6.0
05...	1055	3.30	23.0	20.0	1650	8.5	6.0
05...	1057	6.60	22.5	--	1640	8.6	5.9
05...	1100	13.1	22.5	--	1640	8.6	5.8
05...	1103	19.7	22.0	--	1640	8.6	5.8
05...	1105	24.0	22.0	--	1640	8.6	5.8

06344300 HEART RIVER AT DICKINSON, ND

LOCATION.--Lat 46°51'56", long 102°44'10", in $SW^1/_4NW^1/_4SE^1/_4$ sec.12, T.139 N., R.96 W., Stark County, Hydrologic Unit 101302202, on left bank near the southeast corner of Dickinson sewage lagoon cell No. 3, 1.9 mi southeast of Dickinson and 9.5 mi downstream from Edward Arthur Patterson Lake.

DRAINAGE AREA.--440 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1983 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,360 ft from topographic map.

REMARKS.--Estimated daily discharges: Nov. 14-17, Dec. 17-25, 31, Jan. 3, 11, 12, 18-20, 27, and Feb. 12-21. Records good except those for periods of estimated discharges, which are fair. Flow regulated by Edward Arthur Patterson Lake (station 06343500) 10 mi upstream.

AVERAGE DISCHARGE.--6 years, 20.8 ft^3/s, 15,070 acre-ft/yr.

EXTREME FOR PERIOD OF RECORD.--Maximum discharge, about 3,500 ft^3/s, Mar. 3, 1986, gage height 10.56, backwater from ice; maximum gage height, 10.93 ft, Mar. 1, 1986, backwater from ice; minimum daily discharge, 0.10 ft^3/s, Mar. 27, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 183 ft^3/s, June 28, gage height, 5.21 ft; minimum daily discharge, 0.85 ft^3/s, June 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.9	2.0	1.8	1.4	1.8	1.7	1.6	1.4	2.6	1.2	1.3
2	1.6	1.9	2.0	1.8	1.4	1.7	1.6	1.5	1.5	1.8	1.3	1.2
3	1.6	2.0	1.9	e1.8	1.5	1.7	1.7	1.3	2.0	1.7	1.6	1.2
4	1.6	2.0	1.9	1.8	1.5	1.7	1.7	1.1	1.7	1.6	1.3	1.2
5	1.7	3.1	1.9	1.8	1.6	1.6	1.6	1.1	1.5	1.6	1.2	1.5
6	1.7	2.6	1.9	1.8	1.6	1.6	1.6	1.4	1.4	1.7	1.1	1.4
7	1.7	2.2	1.9	1.8	1.6	1.6	1.7	1.6	1.5	1.8	1.2	1.4
8	1.7	2.1	2.0	1.8	1.6	1.6	1.7	1.6	3.7	1.7	1.3	1.4
9	1.7	2.0	2.0	1.9	1.6	1.7	1.7	1.4	2.2	1.6	1.2	1.3
10	1.6	1.8	2.0	2.1	1.5	1.8	1.8	1.3	1.6	1.6	1.2	1.4
11	1.7	1.8	2.0	e1.9	1.7	1.8	2.0	1.3	1.4	6.9	1.2	1.6
12	1.7	1.8	2.0	e1.7	e1.5	2.0	2.0	1.3	1.3	3.0	1.6	1.3
13	1.7	1.7	2.0	1.7	e1.4	1.8	1.8	1.3	1.1	1.8	2.4	1.3
14	1.6	e1.7	1.9	1.7	e1.3	1.7	1.8	1.2	.85	1.6	3.0	1.4
15	1.7	e1.7	1.8	1.7	e1.2	1.8	1.7	1.3	4.1	1.4	2.0	1.4
16	1.6	e1.6	1.7	1.7	e1.2	2.1	1.8	6.1	3.2	1.2	1.9	1.3
17	1.7	e1.6	e1.6	1.7	e1.2	3.0	1.9	3.3	40	1.1	1.7	1.3
18	1.8	1.6	e1.5	e1.6	e1.2	2.1	2.0	1.9	7.5	1.1	1.5	1.4
19	2.1	1.9	e1.4	e1.6	e1.3	1.8	2.0	1.5	46	1.1	1.4	1.3
20	2.1	2.0	e1.2	e1.6	e1.4	1.8	1.9	1.6	4.5	1.1	1.5	1.5
21	2.0	2.0	e1.1	1.7	e1.6	1.8	1.9	2.4	1.9	1.7	1.5	1.7
22	1.9	1.9	e1.0	1.7	1.9	1.7	4.3	1.7	2.3	1.5	1.4	1.5
23	2.0	1.9	e1.1	1.9	1.9	1.7	3.0	1.3	1.9	1.7	1.4	1.4
24	1.9	1.8	e1.3	1.9	1.8	1.7	2.2	1.0	1.4	1.7	1.3	1.4
25	1.8	1.9	e1.7	1.8	1.8	1.6	20	21	1.3	1.8	1.3	1.4
26	1.8	1.8	1.9	1.8	1.7	1.6	3.7	7.7	1.2	2.1	1.4	1.4
27	33	1.8	2.1	e1.8	1.7	1.6	1.7	2.7	1.2	1.9	1.5	1.4
28	4.3	1.8	2.0	1.8	1.7	1.6	1.5	2.0	60	1.8	2.1	1.4
29	2.2	1.9	1.8	1.8	---	1.7	1.8	1.5	12	1.4	2.0	1.3
30	2.0	1.9	1.8	1.6	---	1.7	1.8	1.3	8.1	1.3	1.7	1.3
31	1.9	---	e1.7	1.4	---	1.8	---	1.3	---	1.2	1.4	---
TOTAL	89.1	57.7	54.1	54.5	42.8	55.2	77.6	78.6	219.75	56.1	47.8	41.3
MEAN	2.87	1.92	1.75	1.76	1.53	1.78	2.59	2.54	7.32	1.81	1.54	1.38
MAX	33	3.1	2.1	2.1	1.9	3.0	20	21	60	6.9	3.0	1.7
MIN	1.6	1.6	1.0	1.4	1.2	1.6	1.5	1.0	.85	1.1	1.1	1.2
AC-FT	177	114	107	108	85	109	154	156	436	111	95	82

CAL YR 1989 TOTAL 1442.36 MEAN 3.95 MAX 91 MIN .86 AC-FT 2860
WTR YR 1990 TOTAL 874.55 MEAN 2.40 MAX 60 MIN .85 AC-FT 1730

e Estimated

06344300 HEART RIVER AT DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
06...	1735	1.7	2140	--	9.0	9.5	--	--	--	--	--	--
NOV												
27...	1445	1.8	2200	--	-5.0	1.5	--	--	--	--	--	--
JAN												
09...	1410	1.9	2300	--	2.5	1.0	--	--	--	--	--	--
FEB												
20...	1430	1.4	2480	--	10.0	1.0	--	--	--	--	--	--
APR												
09...	1535	1.8	2050	8.5	4.0	7.5	310	56	40	360	71	9
MAY												
21...	1600	2.3	1940	--	22.0	18.0	--	--	--	--	--	--
JUN												
29...	1240	18	910	--	28.0	24.0	--	--	--	--	--	--
AUG												
15...	1730	1.8	2050	8.5	34.0	25.0	310	58	41	370	71	9

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	7.4	510	0	420	590	57	0.40	5.2	1390	1370	1.89
AUG											
15...	8.5	510	0	416	630	63	0.50	11	1450	1430	1.97

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
09...	6.61	3	440	70	<1	43	170	<0.1	2	1	760
AUG											
15...	7.01	3	510	20	<1	46	60	<0.1	2	1	780

06344600 GREEN RIVER NEAR NEW HRADEC, ND

LOCATION.--Lat 47°01'40", long 103°03'10", on line between secs.13 and 14, T.141 N., R.98 W., Billings County, Hydrologic Unit 10130202, on left bank above county highway bridge, and 8 mi west of New Hradec.

DRAINAGE AREA.--152 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 2,510 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1 to May 9. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--26 years, 16.3 ft^3/s, 11,810 acre-ft/yr; median of yearly mean discharge, 16 ft^3/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,120 ft^3/s, May 9, 1970, gage height, 16.88 ft; maximum gage height, 17.60 ft, Mar. 22, 1978, backwater from ice; no flow for several days in some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 19	0645	490	10.22	July 10	0500	116	7.69
June 28	1045	*1,240	*13.10				

No flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.30	e2.5	e.56	e.30	e.08	e.80	e1.2	e.73	1.4	20	2.2	.00
2	e.18	e2.2	e.52	e.35	e.07	e.90	e1.4	e.70	1.2	13	2.0	.00
3	e.26	e1.9	e.52	e.35	e.09	e.80	e1.7	e.70	1.0	8.1	1.3	.00
4	e.34	e1.7	e.50	e.37	e.12	e.80	e1.6	e.00	.80	5.6	.65	.00
5	e.42	e1.5	e.50	e.40	e.18	e.80	e1.4	e.10	.75	3.8	.73	.00
6	e.34	e1.4	e.50	e.40	e.20	e.75	e1.3	e.50	.65	2.6	.59	.00
7	e.34	e1.2	e.47	e.45	e.23	e.70	e1.1	e.68	.63	1.8	.38	.00
8	e.38	e1.1	e.52	e.45	e.25	e.75	e.88	e.68	.64	1.2	.24	.00
9	e.36	e.93	e.45	e.48	e.23	e.80	e.66	e.65	.58	1.3	.12	.00
10	e.39	e.86	e.45	e.48	e.23	e1.0	e.61	.64	.53	65	.05	.00
11	e.48	e.80	e.40	e.45	e.24	e1.5	e.51	.65	.50	32	.04	.00
12	e.66	e.77	e.40	e.42	e.28	e2.5	e.45	.61	.49	19	.03	.00
13	e.93	e.83	e.35	e.40	e.30	e3.0	e.44	.56	.42	11	.02	.00
14	e.98	e.69	e.30	e.40	e.33	e2.5	e.36	.53	.36	8.2	.00	.00
15	e.88	e.58	e.25	e.40	e.33	e2.5	e.31	.62	.48	6.4	.04	.00
16	e.84	e.62	e.20	e.37	e.40	e2.5	e.32	.85	.60	4.4	.02	.00
17	e1.1	e.64	e.20	e.37	e.38	e2.5	e.25	.78	1.4	2.7	.01	.00
18	e1.2	e.59	e.15	e.35	e.35	e2.0	e.24	.80	2.9	1.9	.00	.00
19	e1.4	e.54	e.10	e.30	e.38	e3.0	e.27	.97	230	1.3	.00	.00
20	e1.6	e.54	e.05	e.25	e.40	e2.5	e.26	.95	35	.93	.01	.00
21	e1.6	e.64	e.03	e.28	e.50	e2.5	e.24	.90	15	.99	.04	.00
22	e1.7	e.64	e.01	e.28	e.60	e2.5	e.31	.81	9.7	1.1	.05	.00
23	e1.8	e.59	e.03	e.30	e.65	e2.0	e.27	.71	7.4	.98	.08	.00
24	e1.8	e.64	e.07	e.30	e.70	e1.5	e.26	.67	5.1	.85	.11	.00
25	e1.8	e.60	e.10	e.28	e.65	e1.2	e.81	.94	3.4	.90	.11	.00
26	e1.7	e.60	e.10	e.32	e.70	e1.1	e.77	1.6	2.5	1.8	.10	.01
27	e1.6	e.60	e.12	e.32	e.80	e1.0	e.90	4.4	1.5	6.7	.09	.04
28	e2.8	e.60	e.15	e.30	e.70	e1.1	e.87	3.8	498	5.5	.07	.05
29	e2.9	e.58	e.15	e.25	---	e1.1	e.79	2.9	119	3.4	.05	.07
30	e2.3	e.56	e.20	e.20	---	e1.2	e.90	2.4	41	2.9	.04	.12
31	e2.3	---	e.25	e.10	---	e1.2	---	1.9	---	2.3	.02	---
TOTAL	35.68	27.94	8.60	10.67	10.37	49.00	21.38	33.73	982.93	237.65	9.19	0.29
MEAN	1.15	.93	.28	.34	.37	1.58	.71	1.09	32.8	7.67	.30	.010
MAX	2.9	2.5	.56	.48	.80	3.0	1.7	4.4	498	65	2.2	.12
MIN	.18	.54	.01	.10	.07	.70	.24	.00	.36	.85	.00	.00
AC-FT	71	55	17	21	21	97	42	67	1950	471	18	.6

CAL YR 1989 TOTAL 2180.23 MEAN 5.97 MAX 400 MIN .00 AC-FT 4320
WTR YR 1990 TOTAL 1427.43 MEAN 3.91 MAX 498 MIN .00 AC-FT 2830

e Estimated

06344600 GREEN RIVER NEAR NEW HRADEC, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
06...	1425	0.35	1320	--	9.5	8.5	--	--	--	--	--	--
NOV												
20...	1440	0.59	1130	--	3.0	2.5	--	--	--	--	--	--
JAN												
05...	1525	0.41	1440	--	-8.0	1.0	--	--	--	--	--	--
FEB												
16...	1505	0.41	1160	--	-15.0	1.0	--	--	--	--	--	--
MAR												
05...	1500	0.80	750	--	4.5	2.0	--	--	--	--	--	--
22...	1155	2.5	1120	--	-7.0	1.0	--	--	--	--	--	--
APR												
06...	1400	1.3	910	8.4	7.0	7.5	160	32	20	150	66	5
MAY												
11...	1615	0.65	1370	--	16.0	13.0	--	--	--	--	--	--
JUN												
28...	1735	469	360	--	27.0	20.0	--	--	--	--	--	--
29...	1655	103	548	--	29.0	24.5	--	--	--	--	--	--
JUL												
02...	1555	10	684	--	35.0	28.0	--	--	--	--	--	--
AUG												
10...	1015	--	915	7.9	27.0	20.5	180	39	21	140	61	4

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	5.2	320	0	260	240	6.6	0.30	5.5	628	618	0.85
AUG											
10...	9.1	310	0	255	230	7.0	0.30	9.8	605	610	0.82

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
06...	2.20	2	390	90	<1	19	40	0.1	1	<1	380
AUG											
10...	--	3	370	10	<1	16	170	<0.1	3	<1	390

06345500 HEART RIVER NEAR RICHARDTON, ND

LOCATION.--Lat 46°44'46", long 102°18'27", in NE¼ sec.29, T.138 N., R.92 W., Stark County, Hydrologic Unit 10130202, on right bank 5 ft upstream from bridge on State Highway 8, 0.5 mi downstream from Plum Creek, and 9.5 mi south of Richardton.

DRAINAGE AREA.--1,240 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to September 1922, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1209: Drainage area. WSP 1239: 1906, 1918(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 2,153.67 ft above National Geodetic Vertical Datum of 1929. May 18, 1903, to Sept. 30, 1922, nonrecording gage at 3 sites in 1 mi reach below present site at different datums. Apr. 14, 1943, to July 7, 1947, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 16-18, Dec. 5 to Apr. 1, and Aug. 18 to Sept. 30. Records good except those for periods of estimated daily discharges, which are fair. Flow is regulated by Patterson Lake Reservoir (station 06343500) 85 river miles upstream since 1950. Some diversions for irrigation and water supply at low flow.

AVERAGE DISCHARGE.--65 years (water years 1904-07, 1909-22, 1944-90), 103 ft³/s, 74,620 acre-ft/yr; median of yearly mean discharges, 94 ft³/s, 68,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft³/s, Apr. 16, 1950, gage height, 28.05 ft, from high-water mark in gage well; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 5, 1938, reached a stage of about 26 ft, from information by local residents, discharge, 16,000 ft³/s; flood of Mar. 25, 1943, reached a stage of 24.2 ft from floodmarks, discharge, 11,700 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,030 ft³/s, June 30, gage height, 11.33 ft; minimum daily discharge, 0.25 ft³/s, Dec. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	14	8.1	e3.5	e4.0	e10	e13	11	9.7	903	2.8	e.90
2	2.2	13	7.5	e3.9	e4.0	e11	13	9.8	8.7	336	2.7	e.88
3	1.8	13	6.9	e3.9	e4.5	e11	12	9.0	7.8	168	2.4	e.86
4	1.6	12	7.1	e3.8	e5.0	e12	12	9.0	7.5	90	2.2	e.84
5	1.6	11	e7.0	e3.8	e5.5	e13	12	8.6	8.0	60	1.9	e.82
6	1.7	11	e7.0	e4.5	e6.0	e13	11	8.0	7.3	46	1.7	e.80
7	1.7	10	e6.0	e5.0	e6.2	e13	10	7.1	7.6	42	1.5	e.78
8	1.5	11	e6.5	e5.5	e6.5	e14	9.6	6.7	7.5	28	1.2	e.76
9	1.7	10	e7.2	e7.0	e6.5	e15	9.0	6.1	6.5	21	1.0	e.75
10	2.0	9.2	e7.0	e9.0	e7.5	e17	8.1	5.6	6.1	18	1.5	e.74
11	2.1	8.5	e5.0	e7.5	e8.0	e18	8.6	5.8	5.7	17	2.3	e.73
12	2.1	9.0	e4.0	e7.0	e7.5	e19	9.0	6.1	6.2	94	2.1	e.72
13	2.2	9.2	e3.8	e7.0	e6.5	e19	9.3	5.9	6.7	50	1.6	e.71
14	4.3	8.4	e3.4	e6.5	e5.5	e19	9.0	5.3	9.3	55	1.4	e.70
15	4.9	5.8	e3.0	e6.3	e5.0	e19	8.3	5.0	11	47	1.4	e.69
16	4.0	e6.0	e2.5	e6.0	e4.5	e20	8.4	5.0	13	37	1.4	e.68
17	3.6	e6.0	e2.2	e5.8	e4.5	e21	8.2	5.2	22	25	1.4	e.67
18	3.4	e6.5	e1.8	e5.6	e4.6	e22	7.8	5.1	45	19	e1.5	e.66
19	3.1	8.0	e1.6	e5.4	e4.8	e22	7.6	4.9	203	15	e1.4	e.64
20	2.7	8.2	e1.5	e5.0	e5.2	e23	7.4	5.2	130	13	e1.3	e.70
21	4.0	7.9	e.90	e5.0	e6.0	e20	7.1	6.9	106	11	e1.3	e.68
22	4.8	7.4	e.50	e5.2	e7.0	e17	6.8	5.8	218	9.9	e1.2	e.72
23	4.7	7.3	e.25	e5.5	e7.0	e16	7.4	5.0	106	8.9	e1.2	e.68
24	5.2	8.0	e.60	e5.0	e6.5	e15	7.4	5.2	60	7.6	e1.1	e.66
25	6.2	7.7	e.85	e5.5	e7.0	e15	10	9.7	44	7.2	e1.1	e.64
26	8.3	7.7	e1.5	e6.0	e7.5	e14	14	20	30	6.5	e1.1	e.64
27	9.4	5.4	e2.5	e6.0	e8.5	e14	16	49	21	5.0	e1.0	e.64
28	10	7.1	e2.5	e6.2	e9.5	e14	21	38	39	4.3	e.98	e.63
29	16	7.8	e2.5	e6.4	---	e13	16	21	119	3.5	e.95	e.62
30	24	8.3	e2.7	e5.8	---	e13	14	16	1240	3.0	e.93	e.62
31	17	---	e3.0	e5.0	---	e13	---	12	---	2.8	e.90	---
TOTAL	160.5	264.4	116.90	173.6	170.8	495	313.0	323.0	2511.6	2153.7	46.46	21.56
MEAN	5.18	8.81	3.77	5.60	6.10	16.0	10.4	10.4	83.7	69.5	1.50	.72
MAX	24	14	8.1	9.0	9.5	23	21	49	1240	903	2.8	.90
MIN	1.5	5.4	.25	3.5	4.0	10	6.8	4.9	5.7	2.8	.90	.62
AC-FT	318	524	232	344	339	982	621	641	4980	4270	92	43

CAL YR 1989 TOTAL 10280.31 MEAN 28.2 MAX 650 MIN .25 AC-FT 20390
WTR YR 1990 TOTAL 6750.52 MEAN 18.5 MAX 1240 MIN .25 AC-FT 13390

e Estimated

06345500 HEART RIVER NEAR RICHARDTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
02...	1415	2.2	2120	--	5.5	11.5	--	--	--	--	--	--
NOV												
13...	1230	8.8	2190	--	0.0	2.5	--	--	--	--	--	--
JAN												
02...	1405	3.9	3200	--	2.5	0.5	--	--	--	--	--	--
FEB												
12...	1420	7.6	2420	--	-1.0	0.5	--	--	--	--	--	--
MAR												
01...	1400	10	1950	8.4	16.5	1.0	400	77	50	320	63	7
19...	1410	22	1200	--	17.0	1.0	--	--	--	--	--	--
APR												
02...	1205	13	1270	--	12.0	8.0	--	--	--	--	--	--
MAY												
14...	1705	5.2	2000	--	18.0	17.0	--	--	--	--	--	--
JUN												
25...	1320	45	983	--	28.0	23.0	--	--	--	--	--	--
AUG												
13...	1400	1.6	1520	8.5	34.0	25.5	320	63	40	230	60	6

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
01...	8.8	540	0	440	630	27	0.50	4.2	1400	1380	1.90
AUG											
13...	12	410	0	340	470	14	0.40	6.7	1040	1040	1.41

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
01...	39.7	2	510	40	<1	46	30	<0.1	1	1	1100
AUG											
13...	4.46	2	460	10	<1	35	50	<0.1	3	<1	980

06345780 HEART RIVER ABOVE LAKE TSCHIDA NEAR GLEN ULLIN, ND

LOCATION.--Lat 46°39'24", Long 102°04'40" in SW¼NE¼NE¼ sec.30, T.137 N., R.90 W., Grant County, Hydrologic Unit, 10130202, on right bank 100 ft. downstream from bridge on county road, and 16 mi south and 1 mi west of Hebron.

DRAINAGE AREA.--285 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1988 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,090 ft from topographic map.

REMARKS.--Estimated daily discharges: Nov. 15-17, Nov. 27-29, Dec. 6 to Feb. 20, Mar. 6-8, Mar. 13-19, Mar. 21-26, Aug. 2, Aug. 4-9, Aug. 11, 12. Records good except those for periods of estimated daily discharges, which are fair. Flow is regulated by Patterson Lake Reservoir (station 06343500) about 90 river miles upstream from station, and some diversions for irrigation and water supply at low flow.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,120 ft³/s, July 1, 1990, gage height, 8.48 ft; minimum daily discharge, 0.02 ft³/s, Aug. 22-23, Sept. 4-7, Sept. 9, 10, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,120 ft³/s, July 1, 1990, gage height, 8.48 ft; minimum daily discharge, 0.10 ft³/s, Dec. 21, Aug. 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	20	9.6	e5.0	e5.6	12	18	19	19	1320	4.0	.78
2	2.8	17	9.6	e4.7	e5.0	13	18	16	15	385	e2.7	.64
3	2.2	15	9.6	e4.7	e4.5	14	18	13	12	194	2.1	.69
4	2.4	14	9.9	e4.5	e6.0	15	17	12	9.6	123	e1.6	.67
5	3.1	15	10	e4.2	e8.0	15	16	11	9.4	83	e1.3	.90
6	2.7	14	e9.5	e5.2	e8.1	e14	15	11	8.1	62	e.95	.82
7	2.2	13	e9.0	e5.2	e8.2	e14	14	10	8.2	50	e.75	.63
8	2.1	12	e9.0	e5.5	e8.3	e15	13	9.3	9.6	42	e.55	.51
9	2.0	12	e8.5	e6.0	e8.4	16	12	8.7	8.7	35	e.45	.45
10	1.9	12	e8.0	e7.0	e8.5	17	12	8.3	7.9	28	.33	.37
11	2.1	12	e7.0	e6.8	e8.6	23	11	8.0	7.7	24	e.40	.31
12	2.0	11	e5.0	e6.5	e8.6	25	10	6.9	6.9	21	e.45	.26
13	2.0	10	e3.0	e7.0	e8.5	e22	11	7.2	5.6	75	.54	.23
14	2.3	11	e1.5	e7.5	e8.2	e20	11	7.1	5.0	49	.37	.20
15	2.5	e9.0	e.75	e7.4	e8.0	e18	12	7.3	6.0	53	.20	.20
16	2.6	e8.5	e.50	e7.3	e7.8	e19	12	8.3	6.7	45	.12	.17
17	3.8	e8.0	e.35	e7.2	e7.0	e20	11	7.3	9.1	38	.10	.15
18	4.7	9.0	e.30	e7.1	e6.5	e20	10	6.8	9.1	29	.10	.18
19	4.2	11	e.20	e7.0	e6.5	e21	11	7.0	29	22	.55	.18
20	4.4	11	e.15	e7.0	e7.0	26	9.9	6.9	132	19	.47	.18
21	4.5	11	e.10	e8.0	8.8	e24	9.4	7.0	111	16	.25	.18
22	3.5	10	e.15	e8.5	9.3	e20	9.4	6.5	99	14	.19	.22
23	3.5	9.8	e.25	e8.8	10	e15	9.1	6.9	145	12	.39	.22
24	3.7	11	e.40	e8.5	9.3	e15	9.0	6.7	92	10	.65	.23
25	4.5	11	e.80	e8.8	10	e17	12	45	62	9.6	.58	.21
26	4.8	10	e1.7	e8.3	11	e20	12	66	46	8.9	1.2	.22
27	6.3	e8.5	e5.5	e8.0	11	21	14	43	35	8.5	1.2	.20
28	8.2	e8.0	e4.8	e8.2	11	21	16	60	31	7.7	1.3	.18
29	13	e8.5	e4.5	e8.0	---	21	24	49	55	5.9	.82	.18
30	11	9.3	e4.0	e7.0	---	20	22	32	254	3.9	.67	.19
31	23	---	e3.8	e6.4	---	20	---	24	---	4.1	.80	---
TOTAL	141.6	341.6	137.45	211.3	227.7	573	398.8	537.2	1254.6	2797.6	26.08	10.55
MEAN	4.57	11.4	4.43	6.82	8.13	18.5	13.3	17.3	41.8	90.2	.84	.35
MAX	23	20	10	8.8	11	26	24	66	254	1320	4.0	.90
MIN	1.9	8.0	.10	4.2	4.5	12	9.0	6.5	5.0	3.9	.10	.15
AC-FT	281	678	273	419	452	1140	791	1070	2490	5550	52	21

CAL YR 1989 TOTAL 9211.44 MEAN 25.2 MAX 400 MIN .10 AC-FT 18270
WTR YR 1990 TOTAL 6657.48 MEAN 18.2 MAX 1320 MIN .10 AC-FT 13210

e Estimated

06345780 HEART RIVER ABOVE LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA

PERIOD OF RECORD.--October 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
02...	1725	2.7	2340	--	4.0	9.0	--	--	--	--	--	--
NOV												
13...	1605	9.8	1900	--	-1.0	2.0	--	--	--	--	--	--
JAN												
02...	1615	4.7	2570	--	-1.0	0.5	--	--	--	--	--	--
FEB												
12...	1655	8.8	2400	--	-6.0	0.5	--	--	--	--	--	--
MAR												
01...	1020	11	1940	8.1	14.0	1.0	400	76	51	320	63	7
19...	1730	31	1180	--	13.0	6.0	--	--	--	--	--	--
APR												
02...	1550	18	1220	--	14.0	12.0	--	--	--	--	--	--
MAY												
15...	1410	6.8	1720	--	13.0	13.0	--	--	--	--	--	--
JUN												
25...	1750	59	1470	--	32.5	32.5	--	--	--	--	--	--
AUG												
13...	1820	0.58	1600	8.6	32.0	24.0	240	41	33	290	71	8

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
01...	9.4	570	0	470	600	25	0.60	4.1	1390	1370	1.89
AUG											
13...	12	520	0	425	430	13	0.60	6.0	1100	1080	1.50

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
01...	42.8	2	500	60	<1	46	30	<0.1	1	1	1100
AUG											
13...	1.72	2	620	10	<1	36	10	<0.1	3	1	770

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND

LOCATION.--Lat 46°35'43", long 101°48'34", in SW¼NE¼ sec.13, T.136 N., R.89 W., Grant County, Hydrologic Unit 10130202, 10 mi upstream from Heart Butte Creek, and 14 mi north of Elgin.

DRAINAGE AREA.--1,710 mi², approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

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 National Geodetic Vertical Datum of 1929, levels by Water and Power Resources Service.

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, 2,118.2 ft. Dead storage is 6,750 acre-ft below lowest point of outlet, elevation, 2,030.0 ft. Active conservation storage is 69,030 acre-ft between elevations, 2,030.0 ft 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 U.S. Bureau of Reclamation. Monthend elevations interpolated from once-daily readings. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 174,000 acre-ft, Apr. 9, 1952, elevation, 2,086.23 ft; minimum since first reaching spillway level, 38,600 acre-ft, Sept. 30, 1990, elevation, 2,051.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 51,480 acre-ft, July 5, elevation, 2,056.68 ft; minimum, 38,600 acre-ft, Sept. 30, elevation, 2,051.66 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,055.03	46,970	--
Oct. 31	2,054.97	46,810	-160
Nov. 30	2,055.13	47,240	+430
Dec. 31	2,055.13	47,240	0
CAL YR 1989	--	--	-270
Jan. 31	2,055.21	47,450	+210
Feb. 28	2,055.26	47,590	+140
Mar. 31	2,055.84	49,150	+1,560
Apr. 30	2,055.65	48,640	-510
May 31	2,055.45	48,100	-540
June 30	2,055.68	48,710	+610
July 31	2,054.58	45,790	-2,920
Aug. 31	2,052.26	40,000	-5,790
Sept. 30	2,051.66	38,590	-1,410
WTR YR 1990	--	--	-8,380

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	RESERVOIR DEPTH (FEET) (72025)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT 23...	1125	33.0	759	1350	8.6	16.0	10.5	15	176	10.5
JAN 05...	1140	46.4	762	1500	8.1	-6.0	2.0	20	15.6	14.4
JUN 22...	0955	43.5	757	1490	8.1	23.0	19.0	12	2.40	8.7
AUG 21...	1030	37.9	753	1580	8.2	18.5	21.0	12	3.00	8.5

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
OCT 23...	95	300	56	39	190	57	5	11	259	470
JAN 05...	104	330	61	44	220	58	5	12	298	500
JUN 22...	95	310	56	41	210	59	5	11	292	490
AUG 21...	97	310	55	42	220	60	5	12	293	460

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT 23...	11	0.30	0.23	942	933	1.28	<0.100	0.070	310
JAN 05...	12	0.40	0.93	1040	1030	1.41	<0.100	0.020	350
JUN 22...	12	0.30	1.4	898	998	1.22	0.200	0.040	340
AUG 21...	15	0.50	4.3	1010	985	1.37	<0.100	0.030	340

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)
OCT									
23...	1125	0.0	1350	8.6	10.5	10.5	5	0	--
23...	1126	1.60	1350	8.6	10.5	10.5	--	--	--
23...	1128	3.30	1350	8.6	10.5	10.5	--	--	--
23...	1129	6.60	1350	8.6	10.5	10.5	--	--	--
23...	1131	13.2	1350	8.6	10.0	10.5	--	--	--
23...	1132	19.8	1360	8.6	10.0	10.3	--	--	--
23...	1134	26.4	1360	8.6	9.5	9.9	--	--	--
23...	1135	33.0	1360	8.6	9.5	9.9	--	--	--
JAN									
05...	1141	0.0	1530	7.9	1.0	14.7	100	5.0	330
05...	1142	1.60	1520	8.0	1.0	14.5	--	--	--
05...	1144	3.30	1500	8.1	2.0	14.4	--	--	--
05...	1145	6.60	1500	8.2	2.0	14.4	--	--	--
05...	1147	13.1	1500	8.2	2.0	14.2	--	--	--
05...	1148	19.7	1510	8.2	2.5	13.2	--	--	--
05...	1149	26.2	1550	8.2	3.0	12.6	--	--	--
05...	1150	32.8	1610	8.2	3.5	12.4	--	--	--
05...	1152	39.4	1630	8.2	3.5	12.2	--	--	--
05...	1154	46.4	1630	8.2	3.5	12.3	--	--	--
JUN									
22...	0934	0.0	1490	7.9	19.0	9.1	0	6.0	330
22...	0938	1.60	1480	8.0	19.0	8.8	--	--	--
22...	0943	3.30	1490	8.1	19.0	8.7	--	--	--
22...	0944	6.60	1490	8.1	19.0	8.7	--	--	--
22...	0945	13.1	1490	8.1	18.5	8.6	--	--	--
22...	0946	19.7	1490	8.1	18.5	8.6	--	--	--
22...	0948	26.2	1490	8.1	18.5	8.5	--	--	--
22...	0950	32.8	1490	8.1	18.5	8.5	--	--	--
22...	0952	43.5	1490	8.1	18.5	8.4	--	--	--
AUG									
21...	1020	0.0	1580	8.2	21.0	8.5	100	11	--
21...	1021	1.60	1580	8.2	21.0	8.3	--	--	--
21...	1022	3.30	1580	8.2	21.0	8.2	--	--	--
21...	1023	6.60	1580	8.2	21.0	8.1	--	--	--
21...	1024	13.1	1580	8.2	21.0	8.1	--	--	--
21...	1025	19.7	1580	8.2	21.0	8.0	--	--	--
21...	1026	26.2	1580	8.2	21.0	8.0	--	--	--
21...	1027	32.8	1580	8.3	21.0	7.9	--	--	--
21...	1028	37.9	1580	8.3	21.0	7.9	--	--	--

06348000 HEART RIVER NEAR LARK, ND

LOCATION.--Lat 46°36'37", long 101°22'54", in SW¼NW¼SW¼ sec.9, T.136 N., R.85 W., Grant County, Hydrologic Unit 10130203, on right bank 20 ft downstream from county highway bridge, 0.6 mi downstream from Big Muddy Creek, and 10 mi north of Lark.

DRAINAGE AREA.--2,750 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1946 to current year (seasonal records only since Oct. 1982).

GAGE.--Water-stage recorder. Datum of gage is 1,802.83 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 16, 1948, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Mar. 1-9. Records fair except those for period of estimated discharges, which are poor. Flow regulated by Lake Tschida (06346000) 45 mi upstream since 1949.

AVERAGE DISCHARGE.--35 years, (1947-82) 225 ft³/s, 163,000 acre-ft/yr; median of yearly mean discharges, 172 ft³/s, 124,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,200 ft³/s, Apr. 17, 1950, gage height, 20.70 ft, from rating curve extended above 11,000 ft³/s on basis of contracted-opening measurement of peak flow; no flow Jan. 16 to Mar. 4, 1950, Jan. 17-26, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 336 ft³/s, Aug. 18, gage height, 3.58 ft³/s; minimum daily discharge during period Mar. 1 to Sept. 30, 4.3 ft³/s, June 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e17	18	38	8.2	44	53	14
2	---	---	---	---	---	e19	19	33	7.0	38	56	13
3	---	---	---	---	---	e22	18	20	20	35	57	12
4	---	---	---	---	---	e20	17	13	33	26	57	10
5	---	---	---	---	---	e21	17	10	30	20	53	14
6	---	---	---	---	---	e23	16	9.1	26	20	57	15
7	---	---	---	---	---	e24	15	14	15	14	57	19
8	---	---	---	---	---	e25	15	35	15	11	56	25
9	---	---	---	---	---	e28	14	40	13	9.7	57	24
10	---	---	---	---	---	29	13	44	18	26	58	23
11	---	---	---	---	---	34	14	43	18	50	59	22
12	---	---	---	---	---	41	15	42	19	49	58	22
13	---	---	---	---	---	63	14	44	19	47	57	21
14	---	---	---	---	---	47	14	44	19	48	46	16
15	---	---	---	---	---	37	13	46	23	49	33	15
16	---	---	---	---	---	30	11	42	28	50	27	16
17	---	---	---	---	---	25	10	38	34	49	34	15
18	---	---	---	---	---	24	17	35	37	69	184	14
19	---	---	---	---	---	27	20	25	40	78	101	13
20	---	---	---	---	---	25	21	16	37	75	85	12
21	---	---	---	---	---	25	19	11	27	74	75	11
22	---	---	---	---	---	23	16	7.4	20	75	47	10
23	---	---	---	---	---	25	13	6.3	14	79	25	10
24	---	---	---	---	---	25	8.9	8.1	11	81	64	9.7
25	---	---	---	---	---	19	7.0	7.7	8.3	47	115	8.7
26	---	---	---	---	---	17	21	55	6.0	42	37	8.4
27	---	---	---	---	---	17	28	79	4.3	44	31	8.7
28	---	---	---	---	---	17	28	41	11	44	28	8.6
29	---	---	---	---	---	18	31	25	54	43	27	8.6
30	---	---	---	---	---	19	33	15	49	42	23	8.8
31	---	---	---	---	---	19	---	10	---	42	18	---
TOTAL	---	---	---	---	---	805	515.9	896.6	663.8	1420.7	1735	427.5
MEAN	---	---	---	---	---	26.0	17.2	28.9	22.1	45.8	56.0	14.2
MAX	---	---	---	---	---	63	33	79	54	81	184	25
MIN	---	---	---	---	---	17	7.0	6.3	4.3	9.7	18	8.4
AC-FT	---	---	---	---	---	1600	1020	1780	1320	2820	3440	848

e Estimated

06348000 HEART RIVER NEAR LARK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
20...	1225	10	1660	--	11.0	6.0	--	--	--	--	--	--
FEB												
22...	1205	15	1750	--	5.0	0.0	--	--	--	--	--	--
MAR												
06...	1620	23	1320	--	3.0	0.5	--	--	--	--	--	--
15...	1150	49	940	--	-1.0	1.0	--	--	--	--	--	--
29...	1000	18	960	8.3	7.0	5.5	240	46	29	130	54	4
MAY												
16...	1135	42	1420	--	10.0	10.5	--	--	--	--	--	--
JUL												
05...	1345	21	1410	--	25.5	24.5	--	--	--	--	--	--
AUG												
22...	1320	44	1430	8.3	30.0	25.0	320	57	43	210	58	5
SEP												
25...	1145	8.5	1610	--	20.0	14.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
29...	6.1	370	0	300	220	7.4	0.40	2.7	626	622	0.85
AUG											
22...	10	380	0	314	480	15	0.40	4.0	1030	1010	1.40

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
29...	29.9	2	190	20	<1	37	40	0.1	<1	1	610
AUG											
22...	122	1	330	30	<1	38	10	0.1	1	<1	880

06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND

LOCATION.--Lat 46°42'11", long 101°12'37", in $SE^1/_4SW^1/_4SW^1/_4$ sec.6, T.137 N., R.83 W., Morton County, Hydrologic Unit 10130203, on right bank 50 ft upstream from county bridge, 9.5 mi southeast of Judson.

DRAINAGE AREA.--2,930 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to September 1988 (maximum discharges only), October 1988 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,720 ft National Geodetic Vertical Datum, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 15 to Mar. 28. Records fair except those for period Nov. 15 to Mar. 28, which are poor. Flow regulated by Lake Tschida (06346000) since 1949.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,500 ft^3/s, Mar. 23, 1987, gage height, 16.70 ft; minimum daily, 0.65 ft^3/s, May 7, 1990.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 226 ft^3/s, Aug. 19, gage height, 4.05 ft; maximum observed gage height, 4.09 ft, Mar. 12, backwater from ice; minimum daily, 0.65 ft^3/s, May 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	24	e22	e11	e8.0	e16	27	22	5.6	45	21	22
2	13	24	e21	e10	e9.0	e18	25	27	5.9	38	33	14
3	15	22	e22	e10	e11	e23	24	20	6.9	36	43	12
4	15	25	e23	e11	e13	e24	25	7.1	3.5	33	43	15
5	14	24	e22	e12	e12	e26	23	1.6	12	22	38	25
6	12	23	e21	e12	e12	e29	22	.69	17	13	33	22
7	14	23	e19	e13	e13	e31	21	.65	16	7.7	42	27
8	15	23	e20	e13	e13	e33	20	1.1	9.7	2.4	45	23
9	16	24	e19	e14	e13	e38	18	8.2	2.4	.81	45	34
10	19	23	e16	e15	e13	e46	19	23	1.5	.78	46	34
11	19	22	e15	e14	e13	e55	18	29	1.1	2.4	47	36
12	19	22	e13	e13	e14	e78	19	29	1.7	19	57	31
13	20	21	e11	e12	e13	e85	17	25	3.6	28	57	30
14	20	21	e9.0	e12	e11	e67	14	27	4.3	23	55	30
15	19	e20	e8.0	e12	e10	e56	12	36	7.9	15	50	25
16	19	e20	e7.5	e12	e9.0	e44	12	45	18	17	32	21
17	19	e21	e7.0	e11	e10	e36	11	43	31	27	22	17
18	20	e21	e7.0	e11	e10	e35	9.2	31	36	26	27	23
19	20	e22	e8.0	e10	e11	e36	7.7	30	42	45	144	21
20	20	e22	e9.0	e9.0	e15	e36	14	20	42	52	93	20
21	20	e22	e11	e10	e14	e34	11	14	37	58	83	19
22	21	e21	e12	e10	e13	e33	9.9	8.9	29	57	69	18
23	21	e20	e11	e11	e14	e32	6.9	3.7	20	54	51	17
24	21	e22	e10	e12	e13	e34	4.2	1.1	14	61	38	18
25	21	e23	e10	e11	e14	e32	6.2	4.2	6.2	63	97	18
26	21	e21	e11	e12	e14	e31	4.6	8.9	4.5	35	127	16
27	22	e20	e10	e12	e15	e30	2.3	21	3.3	24	53	16
28	21	e19	e10	e12	e15	e30	14	63	11	24	37	16
29	22	e19	e9.0	e13	---	28	17	32	9.2	19	29	18
30	21	e21	e9.5	e12	---	28	15	18	33	20	27	16
31	22	---	e10	e10	---	27	---	9.3	---	24	25	---
TOTAL	573	655	413.0	362.0	345.0	1151	449.0	610.44	435.3	892.09	1609	654
MEAN	18.5	21.8	13.3	11.7	12.3	37.1	15.0	19.7	14.5	28.8	51.9	21.8
MAX	22	25	23	15	15	85	27	63	42	63	144	36
MIN	12	19	7.0	9.0	8.0	16	2.3	.65	1.1	.78	21	12

CAL YR 1989 TOTAL 12983.7 MEAN 35.6 MAX 280 MIN 1.5
WTR YR 1990 TOTAL 8148.83 MEAN 22.3 MAX 144 MIN .65

e Estimated

06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
20...	1045	20	1650	--	8.0	3.5	--	--	--	--	--	--
DEC												
04...	1255	23	1700	--	9.0	0.5	--	--	--	--	--	--
JAN												
08...	1115	13	1270	--	4.5	0.0	--	--	--	--	--	--
FEB												
22...	1425	13	1800	--	5.5	0.0	--	--	--	--	--	--
MAR												
12...	1640	78	850	--	7.5	1.0	--	--	--	--	--	--
28...	1045	30	1220	8.5	7.0	5.0	260	53	32	190	60	5
MAY												
16...	1015	46	1490	--	9.0	9.5	--	--	--	--	--	--
JUL												
05...	1205	29	1500	--	26.0	22.5	--	--	--	--	--	--
AUG												
22...	1110	79	1260	8.2	26.5	23.0	260	49	34	170	57	5
SEP												
25...	1015	19	1570	--	18.5	13.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
28...	6.7	430	10	370	310	10	0.40	4.4	813	828	1.11
AUG											
22...	10	330	0	267	370	12	0.40	5.2	828	811	1.13

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
28...	65.6	2	290	40	<1	47	20	0.1	<1	1	700
AUG											
22...	176	1	290	30	1	34	10	0.2	2	<1	720

06349000 HEART RIVER NEAR MANDAN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°50'02", long 100°58'27", in NW¼NE¼ sec.25, T.139 N., R.82 W., Morton County, Hydrologic Unit 10130203, on left bank near downstream wingwall of bridge on county highway, 3 mi west of Mandan, and 4 mi downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1924, March 1928 to June 1933, August 1937 to current year. Published as "at Sunny" 1924, 1928-33.

REVISED RECORDS.--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,638.70 ft above National Geodetic Vertical Datum of 1929, and 1,623.03 ft above Burlington Northern Railway datum. See WSP 1729 or 1917 for history of changes prior to June 30, 1958.

REMARKS.--Estimated daily discharges: Oct. 1-20, and Nov. 16 to Mar. 30. Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by Lake Tschida (station 06346000) 105 mi upstream since 1949. Some diversions above station.

AVERAGE DISCHARGE.--57 years (water years 1929-32, 1938-90), 260 ft³/s, 188,400 acre-ft/yr; median of yearly mean discharges, 191 ft³/s, 138,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 30,500 ft³/s, 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 222 ft³/s, Aug. 25, gage height, 2.81 ft; maximum gage height, 5.06 ft, Mar. 28, ice jam; minimum daily discharge, 0.00 ft³/s, July 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e13	21	e23	e1.6	e2.7	e13	52	19	22	18	.42	19
2	e13	20	e22	e1.6	e2.9	e15	46	18	53	30	5.9	17
3	e12	21	e23	e1.6	e3.0	e16	43	22	19	36	1.3	15
4	e12	22	e23	e2.0	e3.1	e18	40	26	14	24	4.3	15
5	e13	21	e23	e2.1	e3.1	e20	37	23	11	20	14	14
6	e13	23	e21	e2.5	e3.1	e21	35	14	8.7	18	16	15
7	e13	22	e17	e2.4	e3.2	e21	33	6.5	12	14	13	17
8	e12	23	e17	e2.8	e3.1	e24	32	3.5	20	10	13	16
9	e10	22	e17	e3.1	e3.0	e27	30	2.2	21	3.3	15	17
10	e11	19	e17	e3.1	e3.1	e30	29	1.3	19	.20	16	17
11	e11	16	e13	e2.9	e3.2	e37	28	.38	14	.77	15	19
12	e11	15	e10	e2.7	e3.1	e41	27	10	7.5	.81	18	20
13	e11	14	e7.5	e2.8	e3.0	e47	26	23	5.9	.04	21	20
14	e12	14	e6.5	e3.0	e2.9	e54	26	24	8.4	.00	25	20
15	e12	19	e7.0	e3.1	e2.8	e60	26	27	14	2.0	23	20
16	e12	e15	e7.5	e3.1	e2.9	e58	24	33	18	.71	24	20
17	e12	e19	e7.0	e2.9	e3.0	e56	22	36	20	.83	21	19
18	e12	e19	e4.5	e2.8	e3.1	e54	20	38	29	.31	15	19
19	e12	e21	e3.0	e2.7	e3.2	e52	19	38	52	2.3	10	18
20	e12	e23	e2.0	e2.8	e3.7	e52	18	32	54	2.5	32	19
21	13	e22	e1.5	e2.9	e4.3	e53	16	29	56	12	85	20
22	13	e20	e1.2	e3.1	e5.0	e55	17	23	55	20	64	19
23	12	e21	e.90	e3.0	e6.2	e57	17	19	48	20	80	18
24	13	e22	e.85	e3.0	e7.5	e62	16	13	36	21	70	18
25	14	e23	e.95	e3.2	e9.2	e66	17	12	23	23	150	17
26	14	e22	e1.0	e3.2	e10	e71	15	17	18	27	79	17
27	17	e22	e1.0	e3.1	e12	e75	11	14	18	23	108	16
28	18	e22	e1.2	e2.9	e14	e68	11	13	14	16	63	14
29	19	e22	e1.2	e2.8	---	e63	10	35	20	2.8	32	15
30	19	e23	e1.2	e2.6	---	e60	12	45	21	1.3	23	15
31	19	---	e1.4	e2.5	---	58	---	27	---	.01	20	---
TOTAL	410	608	283.40	83.9	129.4	1404	755	643.88	731.5	349.88	1076.92	525
MEAN	13.2	20.3	9.14	2.71	4.62	45.3	25.2	20.8	24.4	11.3	34.7	17.5
MAX	19	23	23	3.2	14	75	52	45	56	36	150	20
MIN	10	14	.85	1.6	2.7	13	10	.38	5.9	.00	.42	14
AC-FT	813	1210	562	166	257	2780	1500	1280	1450	694	2140	1040

CAL YR 1989 TOTAL 14954.12 MEAN 41.0 MAX 821 MIN .14 AC-FT 29660
WTR YR 1990 TOTAL 7000.88 MEAN 19.2 MAX 150 MIN .00 AC-FT 13890

e Estimated

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1971-76, 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
20...	1420	11	1680	--	20.0	9.0	--	--	--	--	--
NOV											
28...	1115	22	1820	8.2	-10.0	1.0	1.4	13.8	96	K5	170
JAN											
09...	1115	3.1	2900	7.8	3.5	0.0	1.5	6.4	44	K2	80
FEB											
26...	1200	10	1800	7.8	5.0	0.0	1.9	7.8	53	K1	230
MAR											
15...	1505	60	900	--	-1.0	0.5	--	--	--	--	--
28...	1430	68	1180	8.3	8.0	2.0	--	--	--	--	--
APR											
09...	1130	29	1500	8.5	9.5	8.0	1.0	12.6	105	<1	25
MAY											
16...	1455	33	1500	--	10.5	12.0	--	--	--	--	--
JUN											
26...	1000	23	1620	8.5	28.0	23.5	5.2	7.8	92	--	--
AUG											
20...	1145	10	1640	8.6	24.0	22.0	1.5	9.2	105	K24	--
SEP											
25...	1330	17	1630	--	30.0	19.5	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
NOV										
28...	400	71	53	280	60	6	7.8	501	611	0
JAN										
09...	620	120	77	430	60	8	12	776	947	0
FEB										
26...	390	77	47	270	60	6	7.9	502	612	0
APR										
09...	300	53	40	240	63	6	6.4	405	465	14
JUN										
26...	310	46	47	270	65	7	10	347	394	14
AUG										
20...	300	45	45	270	65	7	11	346	373	24

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
NOV										
28...	510	16	0.50	6.5	1260	1250	1.71	74.5	--	<0.010
JAN										
09...	790	28	0.60	12	1980	1940	2.69	16.4	--	<0.010
FEB										
26...	500	17	0.40	7.8	1260	1230	1.71	35.7	0.210	0.020
APR										
09...	390	17	0.30	1.7	1020	992	1.39	80.1	--	<0.010
JUN										
26...	600	4.7	0.30	4.7	1120	1190	1.52	70.8	--	<0.010
AUG										
20...	530	22	0.40	3.7	1140	1130	1.55	32.0	--	<0.010

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV										
28...	<0.100	0.020	0.020	0.50	0.040	<0.010	<0.010	20	<1	52
JAN										
09...	0.260	0.260	0.270	0.80	0.020	0.010	<0.010	--	--	--
FEB										
26...	0.230	0.090	0.100	0.60	0.030	<0.010	<0.010	<10	<1	52
APR										
09...	<0.100	0.020	0.010	0.50	0.020	<0.010	<0.010	<10	<1	46
JUN										
26...	<0.100	0.021	0.021	0.60	0.021	<0.010	<0.010	10	1	64
AUG										
20...	<0.100	<0.010	<0.010	3.3	0.040	<0.010	<0.010	--	--	--

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV										
28...	<0.5	<1.0	1	<3	2	7	<1	76	13	0.2
FEB										
26...	<0.5	1.0	<5	<3	<10	12	10	62	22	0.1
APR										
09...	<0.5	1.0	<5	<3	<10	14	10	60	41	0.2
JUN										
26...	<0.5	<1.0	2	<3	2	6	<1	62	6	0.3

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
28...	<10	2	<1	<1.0	900	<6	4	24	1.4	66
JAN										
09...	--	--	--	--	--	--	--	167	1.4	27
FEB										
26...	10	10	<1	4.0	890	<6	22	68	1.9	40
APR										
09...	<10	10	<1	<1.0	690	<6	<3	8	0.63	46
JUN										
26...	<10	4	<1	<1.0	780	<6	4	30	1.9	90
AUG										
20...	--	--	--	--	--	--	--	8	0.22	41

06349070 MISSOURI RIVER BELOW MANDAN, ND

LOCATION.--Lat 46°44'32", long 100°49'54", at midsection of west half sec.30, T.138 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 1 mi south of Fort Lincoln State Park, 6 mi southeast of Mandan, and at mile 1,309.

DRAINAGE AREA.--189,800 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Stage regulated by Garrison Dam (station 06338490) 80.9 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.71 ft, Mar. 17, 1972; minimum daily recorded, 17.40 ft, Apr. 1, 1968.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.60	20.30	22.17	26.52	26.37	22.99	20.59	21.69	22.29	22.19	21.76	21.78
2	19.66	20.66	22.18	26.39	26.75	22.57	20.57	21.63	22.33	22.16	21.76	21.59
3	19.59	20.88	22.03	26.29	26.93	22.41	20.56	21.62	22.27	22.15	21.79	21.63
4	19.53	21.24	22.07	26.31	27.84	22.30	20.40	21.71	22.18	22.20	21.75	21.72
5	19.46	21.40	22.09	26.31	28.36	21.94	20.53	21.74	22.17	22.14	21.65	21.58
6	19.69	21.28	22.05	26.33	28.23	21.72	21.06	21.66	22.21	22.12	21.55	20.79
7	19.53	21.38	22.02	26.33	27.54	21.31	21.47	21.78	22.14	22.13	21.54	19.90
8	19.55	21.37	22.30	26.41	27.20	21.21	21.57	21.62	22.23	22.20	21.58	19.63
9	19.52	21.36	22.14	26.52	26.89	21.10	21.62	21.67	22.19	22.10	21.63	19.55
10	19.50	21.34	21.82	26.55	26.63	21.04	21.61	21.63	22.15	22.10	21.65	19.35
11	19.50	21.45	21.69	26.56	26.49	20.87	21.72	21.81	22.14	22.18	21.61	19.28
12	19.44	21.33	21.83	---	25.79	20.81	21.44	21.68	22.16	22.14	21.61	19.46
13	19.74	21.35	22.75	25.22	24.75	20.66	21.70	21.68	22.14	22.12	21.59	19.37
14	19.56	21.52	25.12	25.72	25.48	20.64	21.60	21.78	22.12	22.11	21.66	19.16
15	19.84	21.56	24.69	26.12	25.53	20.69	21.65	21.67	22.18	22.11	21.57	19.11
16	19.81	22.06	24.98	26.43	26.04	20.65	21.58	21.69	22.18	22.09	21.60	19.18
17	19.41	22.15	25.27	26.32	26.06	20.46	21.59	21.70	22.19	22.08	21.66	19.12
18	19.40	22.23	---	26.24	25.99	20.48	21.69	21.57	22.24	22.09	21.64	19.19
19	19.50	22.19	---	26.09	26.34	20.47	21.58	21.85	22.29	22.08	21.68	19.12
20	19.43	22.05	---	26.06	26.59	20.59	21.60	22.15	22.23	22.08	21.64	19.14
21	19.48	21.92	---	26.00	26.94	20.61	21.58	22.17	22.22	22.08	21.63	19.13
22	19.37	22.00	---	26.10	27.19	20.70	21.68	22.23	22.22	22.07	21.66	19.12
23	19.38	22.03	26.14	26.44	27.44	20.51	21.60	22.19	22.18	22.04	21.66	19.08
24	19.55	22.11	26.69	26.42	26.05	20.65	21.50	22.22	22.15	22.07	21.70	19.10
25	19.81	22.18	26.98	26.09	25.21	20.48	21.63	22.23	22.13	22.11	21.83	19.08
26	19.49	22.10	27.07	25.85	25.29	20.51	21.66	22.31	22.15	22.14	21.69	19.27
27	19.46	22.10	26.91	25.08	24.31	20.48	21.54	22.29	22.19	22.16	21.64	19.15
28	19.50	22.15	26.94	24.58	23.50	20.47	21.75	22.22	22.24	22.11	21.67	19.10
29	19.39	22.19	26.85	24.31	---	20.55	21.64	22.22	22.18	22.01	21.81	19.07
30	19.50	22.22	26.61	24.77	---	20.56	21.61	22.22	22.19	21.81	21.72	19.13
31	19.59	---	26.52	26.11	---	20.53	---	22.26	---	21.75	21.63	---
MEAN	19.54	21.67	---	---	26.35	21.00	21.41	21.90	22.20	22.09	21.66	19.70
MAX	19.84	22.23	---	---	28.36	22.99	21.75	22.31	22.33	22.20	21.83	21.78
MIN	19.37	20.30	---	---	23.50	20.46	20.40	21.57	22.12	21.75	21.54	19.07

06349215 LONG LAKE CREEK ABOVE LONG LAKE NEAR MOFFIT, ND

LOCATION.--Lat 46°37'59", long 100°14'29", in NE¼NE¼NW¼ sec.4, T.136 N., R.76 W., Emmons County, Hydrologic Unit 10130103, on left bank 2.5 mi upstream from Long Lake 4.5 mi southeast of Moffit.

DRAINAGE AREA.--250 mi² approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,720 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 16, 27, Dec. 6, 7, Dec. 11 to Mar. 28, and July 1 to Sept. 30. Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 42 ft³/s, June 20, gage height, 1.37 ft; minimum daily, 0.10 ft³/s, Aug. 8-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.65	1.9	e1.2	e.60	e12	9.3	4.8	2.7	e3.0	e.13	e.17
2	.76	.70	2.0	e1.0	e.50	e10	9.1	5.2	4.8	e2.4	e.12	e.16
3	.70	.72	1.7	e.90	e.70	e12	9.5	5.3	4.0	e1.7	e.13	e.15
4	.70	.80	2.0	e.92	e.80	e11	8.5	5.3	4.1	e1.4	e.12	e.16
5	.70	.85	2.3	e1.2	e.80	e10	7.3	5.2	5.4	e1.2	e.11	e.17
6	.67	.93	e2.1	e1.3	e.80	e10	6.9	5.6	5.6	e1.2	e.11	e.19
7	.71	1.1	e1.9	e1.3	e.78	e10	6.7	5.9	5.1	e1.1	e.11	e.17
8	.73	1.4	1.7	e1.2	e.77	e11	6.4	5.2	4.6	e1.0	e.10	e.16
9	.64	1.6	1.7	e1.3	e.76	e12	5.9	4.6	4.2	e.90	e.10	e.15
10	.60	3.5	1.7	e1.4	e.74	e13	5.6	4.4	4.0	e.84	e.10	e.15
11	.65	2.9	e1.5	e1.1	e.80	e14	5.2	4.3	3.7	e.80	e.10	e.14
12	.60	2.4	e1.2	e.80	e.50	e15	5.3	4.0	3.5	e.75	e.10	e.14
13	.61	1.9	e1.2	e.90	e.50	e16	5.3	3.7	3.1	e.70	e.10	e.14
14	.68	1.7	e1.1	e1.2	e.50	e18	5.5	3.3	2.8	e.65	e.10	e.14
15	.65	1.7	e.90	e1.0	e.50	e18	5.3	3.2	2.9	e.62	e.10	e.14
16	.76	e1.6	e.80	e.94	e.50	e19	5.4	5.5	3.0	e.58	e.10	e.14
17	.70	1.5	e.70	e.88	e.50	e20	5.3	3.2	3.4	e.55	e.10	e.14
18	.65	1.7	e.60	e.84	e.50	e21	5.2	3.0	3.4	e.51	e.10	e.14
19	.60	1.8	e.56	e1.0	e1.4	e20	4.7	3.0	6.1	e.47	e.10	e.15
20	.67	2.0	e.52	e1.2	e4.0	e19	4.6	3.1	31	e.44	e.10	e.15
21	.65	2.4	e.56	e1.3	e10	e19	4.4	3.7	27	e.42	e.11	e.14
22	.70	2.4	e.64	e1.4	e15	e18	5.5	3.6	16	e.39	e.12	e.14
23	.76	2.0	e.72	e1.5	e30	e17	5.1	3.4	9.0	e.35	e.14	e.14
24	.76	2.3	e.86	e1.3	e12	e16	4.4	3.5	6.7	e.32	e.16	e.13
25	.76	2.1	e.86	e1.5	e9.0	e15	4.5	3.8	5.4	e.28	e.15	e.13
26	.78	2.1	e.90	e1.8	e11	e15	4.5	3.7	4.8	e.25	e.17	e.13
27	.70	e2.0	e.62	e1.5	e10	e14	4.3	3.0	4.8	e.26	e.15	e.14
28	.70	2.0	e.62	e1.6	e11	e11	4.0	2.6	5.0	e.28	e.13	e.15
29	.65	2.1	e.64	e1.7	---	9.5	4.1	2.3	4.0	e.20	e.14	e.16
30	.70	2.0	e.78	e1.5	---	9.3	4.4	2.3	3.4	e.16	e.15	e.17
31	.65	---	e.88	e1.3	---	9.9	---	2.5	---	e.14	e.16	---
TOTAL	21.39	52.85	36.16	37.98	124.95	444.7	172.2	122.2	193.5	23.86	3.71	4.48
MEAN	.69	1.76	1.17	1.23	4.46	14.3	5.74	3.94	6.45	.77	.12	.15
MAX	.80	3.5	2.3	1.8	30	21	9.5	5.9	31	3.0	.17	.19
MIN	.60	.65	.52	.80	.50	9.3	4.0	2.3	2.7	.14	.10	.13
AC-FT	42	105	72	75	248	882	342	242	384	47	7.4	8.9

CAL YR 1989 TOTAL 3929.94 MEAN 10.8 MAX 359 MIN .15 AC-FT 7800
WTR YR 1990 TOTAL 1237.98 MEAN 3.39 MAX 31 MIN .10 AC-FT 2460

e Estimated

06349215 LONG LAKE CREEK ABOVE LONG LAKE NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
06...	0930	0.94	860	--	3.5	3.0	--	--	--	--	--	--
MAR												
05...	1020	10	700	7.4	-2.0	0.0	150	30	17	93	54	3
AUG												
28...	1120	0.13	965	8.7	23.0	23.5	220	42	27	140	57	4

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
05...	20	260	0	210	140	7.1	0.10	11	468	447	0.64
AUG											
28...	11	540	0	439	100	10	0.40	12	640	606	0.87

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
05...	13.3	2	230	300	<1	100	110	0.1	<1	1	280
AUG											
28...	0.22	1	440	30	<1	150	10	0.1	<1	<1	390

06349275 LONG LAKE CREEK BELOW LONG LAKE NEAR MOFFIT, ND

LOCATION.--Lat 47°41'30", long 100°17'10", in NW¼NW¼NW¼ sec.16, T.137 N., R.76 W., Burleigh County, Hydrologic Unit 10130103, on right bank at road crossing of the outflow of Long Lake, 1.0 mi north of Moffit.

DRAINAGE AREA.--380 mi^2 contributing, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,715 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Some regulation by several U.S. Fish and Wildlife Service control structures on the Long Lake National Wildlife Refuge.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 0.77 ft^3/s, July 1, gage height, 1.44 ft; no flow most of the year..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.28	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.21	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.31	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.16	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.18	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	1.33	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.011	.043	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.18	.31	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.7	2.6	.00	.00

CAL YR 1989 TOTAL 287.85 MEAN .79 MAX 8.5 MIN .00 AC-FT 571
WTR YR 1990 TOTAL 1.67 MEAN .005 MAX .31 MIN .00 AC-FT 3.3

06349275 LONG LAKE CREEK BELOW LONG LAKE NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1989.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
JUN 28...	1245	0.03	2180	8.0	31.5	25.5	370	60	53	380	67	9

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
JUN 28...	24	660	0	539	660	27	0.40	16	1600	1550	2.18

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
JUN 28...	0.13	10	730	60	<1	250	370	0.1	1	1	620

06349500 APPLE CREEK NEAR MENOKEN, ND

LOCATION.--Lat 46°47'40", long 100°39'25", in NW¼NE¼ sec.9, T.138 N., R.79 W., Burleigh County, Hydrologic Unit 10130103, on left bank 75 ft downstream from bridge on county highway, 4 mi upstream from Hay Creek, 6.3 mi west of Menoken, and 6.4 mi east of Bismarck.

DRAINAGE AREA.--1,680 mi², approximately, of which about 500 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to June 1905, October 1945 to current year. Published as "near Bismarck" 1905.

REVISED RECORDS.--WSP 1209: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,638.61 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1953.

REMARKS.--Estimated daily discharges: Nov. 14 to Feb. 25. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--45 years, 33.0 ft³/s, 24,420 acre-ft/yr; median of yearly mean discharges, 19 ft³/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,750 ft³/s, Apr. 18, 1950, gage height, 17.07 ft; maximum gage height, 17.46 ft, Apr. 19, 1979; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 11	1015	6.9	4.38				

Minimum daily discharge, 0.01 ft³/s, Aug. 30 to Sept. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.09	e.06	e.10	e.08	1.2	.82	.30	.18	.17	.07	.01
2	.06	.08	e.07	e.10	e.07	1.4	1.1	.29	.31	.44	.07	.01
3	.08	.09	e.07	e.10	e.07	.87	.99	.30	.27	.76	.07	.01
4	.08	.09	e.07	e.10	e.08	.96	.77	.24	.17	.50	.08	.02
5	.08	.08	e.06	e.10	e.09	.74	.90	.30	.14	.26	.11	.04
6	.07	.08	e.06	e.09	e.09	.60	.73	.43	.12	.17	.12	.05
7	.08	.09	e.06	e.10	e.10	.44	.68	.54	.12	.50	.11	.05
8	.08	.09	e.06	e.11	e.10	.57	.60	.57	.15	.58	.10	.04
9	.07	.08	e.06	e.11	e.10	.78	.61	.74	.13	.51	.09	.03
10	.08	.06	e.06	e.10	e.09	.95	.57	.83	.10	.52	.08	.02
11	.09	.06	e.06	e.09	e.09	5.9	.47	.82	.07	.58	.09	.02
12	.08	.05	e.06	e.10	e.09	5.9	.43	.78	.06	.58	.10	.02
13	.08	.05	e.06	e.10	e.08	5.0	.41	.84	.06	.64	.09	.02
14	.07	e.05	e.06	e.10	e.08	3.8	.39	.76	.05	.57	.08	.02
15	.06	e.04	e.06	e.10	e.08	2.5	.40	.87	.08	.43	.07	.02
16	.06	e.04	e.06	e.11	e.08	1.9	.44	.81	.10	.34	.06	.02
17	.06	e.04	e.06	e.10	e.07	1.6	.48	.39	.17	.30	.05	.03
18	.06	e.04	e.06	e.10	e.07	1.2	.48	.32	.16	.24	.05	.05
19	.06	e.04	e.05	e.10	e.08	.92	.52	.48	.66	.15	.06	.04
20	.06	e.05	e.05	e.10	e.08	.93	.48	.52	.51	.11	.06	.04
21	.06	e.05	e.05	e.09	e.09	.87	.42	.52	.27	.08	.05	.04
22	.06	e.05	e.04	e.09	e.10	.88	.36	.55	.15	.07	.04	.04
23	.06	e.06	e.05	e.09	e.15	.75	.33	.53	.09	.06	.04	.03
24	.06	e.05	e.06	e.09	e1.0	.65	.25	.47	.06	.04	.03	.03
25	.06	e.06	e.07	e.09	e2.5	.59	.29	.43	.04	.04	.05	.03
26	.07	e.06	e.08	e.08	1.4	.56	.35	.48	.04	.24	.05	.03
27	.07	e.06	e.10	e.08	1.2	.56	.45	.36	.07	.27	.04	.03
28	.07	e.06	e.11	e.09	1.3	.55	.47	.33	.10	.16	.03	.04
29	.08	e.06	e.10	e.09	---	.64	.41	.40	.12	.11	.02	.04
30	.08	e.06	e.09	e.10	---	.60	.34	.38	.10	.09	.01	.04
31	.08	---	e.10	e.09	---	.58	---	.26	---	.08	.01	---
TOTAL	2.16	1.86	2.06	2.99	9.41	45.39	15.94	15.84	4.65	9.59	1.98	0.91
MEAN	.070	.062	.066	.096	.34	1.46	.53	.51	.15	.31	.064	.030
MAX	.09	.09	.11	.11	2.5	5.9	1.1	.87	.66	.76	.12	.05
MIN	.05	.04	.04	.08	.07	.44	.25	.24	.04	.04	.01	.01
AC-FT	4.3	3.7	4.1	5.9	19	90	32	31	9.2	19	3.9	1.8

CAL YR 1989 TOTAL 1002.28 MEAN 2.75 MAX 79 MIN .01 AC-FT 1990
WTR YR 1990 TOTAL 112.78 MEAN .31 MAX 5.9 MIN .01 AC-FT 224

e Estimated

06349500 APPLE CREEK NEAR MENOKEN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	0945	0.09	1340	--	6.0	5.0	--	--	--	--	--	--
NOV												
16...	0924	0.04	1180	--	-3.0	2.0	--	--	--	--	--	--
16...	1001	0.02	1180	--	-3.0	2.0	--	--	--	--	--	--
DEC												
12...	1400	0.11	870	--	--	0.0	--	--	--	--	--	--
FEB												
07...	1348	0.09	1440	--	11.0	1.0	--	--	--	--	--	--
MAR												
01...	1020	1.1	2300	--	9.5	1.0	--	--	--	--	--	--
MAY												
08...	1050	0.54	1070	7.7	24.0	13.5	290	50	41	310	69	8
JUN												
06...	1000	0.54	1370	--	25.0	22.0	--	--	--	--	--	--
AUG												
23...	1200	0.04	1630	9.3	26.0	21.0	200	26	32	290	75	9

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAY											
08...	8.3	660	35	600	320	57	0.50	0.70	1180	1150	1.60
AUG											
23...	6.6	540	80	580	240	53	0.50	4.9	1080	1000	1.47

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAY											
08...	1.72	5	1100	20	<1	120	10	<0.1	<1	<1	500
AUG											
23...	0.12	<1	1200	60	<1	110	20	0.1	<1	<1	400

06349700 MISSOURI RIVER NEAR SCHMIDT, ND

LOCATION.--Lat 46°39'22", long 100°44'18", in SW¼NE¼ sec.26, T.137 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 2 mi southeast of abandoned townsite of Schmidt, 13 mi southeast of Mandan, and at mile 1,298.

DRAINAGE AREA.--191,700 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 91.1 mi upstream, and backwater from Lake Oahe.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.56 ft, Dec. 9, 1976; minimum daily recorded, 7.92 ft, May 30, 1967.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.89	12.54	15.12	---	---	18.16	13.28	14.51	15.16	15.05	14.48	14.44
2	11.98	13.07	15.16	19.93	---	16.46	13.27	14.48	15.25	15.05	14.47	14.32
3	11.90	13.34	14.99	19.88	---	15.49	13.26	14.41	15.25	15.01	14.50	14.29
4	11.85	13.71	15.01	19.92	17.08	15.14	13.08	14.48	15.09	15.07	14.48	14.40
5	11.69	14.01	15.06	---	17.96	14.72	13.16	14.52	---	15.03	14.41	14.37
6	12.00	13.97	15.04	---	18.33	14.41	13.67	14.47	---	14.94	14.25	13.62
7	11.85	14.04	15.00	20.01	17.93	13.90	14.26	14.53	---	14.96	14.21	12.44
8	11.85	14.11	15.25	20.05	17.65	13.76	14.44	14.42	---	15.05	14.23	11.97
9	11.82	14.13	15.32	20.12	17.65	13.64	14.58	14.45	---	14.99	14.30	11.87
10	11.80	14.09	---	20.12	17.48	13.61	14.62	14.41	---	14.93	14.35	11.69
11	11.78	14.19	---	20.12	17.45	13.46	14.69	14.59	---	15.05	14.32	11.52
12	11.71	14.08	14.69	---	17.62	13.45	14.46	14.46	---	15.02	14.33	11.74
13	11.93	14.08	---	18.79	---	13.28	14.56	14.38	---	14.95	14.31	11.72
14	11.94	14.20	---	19.12	---	13.34	14.53	14.51	---	14.93	14.34	11.52
15	12.09	---	---	19.39	---	13.33	14.55	---	---	14.92	14.32	11.42
16	12.15	---	---	19.79	---	13.40	14.52	---	---	14.89	14.27	11.49
17	11.89	---	---	19.75	---	13.19	14.47	---	---	14.88	14.31	11.45
18	11.66	---	---	19.71	---	13.14	14.52	---	---	14.89	14.35	11.52
19	11.82	15.01	---	---	---	13.15	14.46	14.49	---	14.87	14.36	11.46
20	11.76	14.95	---	---	17.31	13.27	14.43	14.89	---	14.87	14.36	11.48
21	11.80	14.80	---	19.45	17.77	13.33	14.37	14.97	---	14.87	14.31	11.49
22	11.66	---	---	19.41	18.28	13.49	14.46	15.06	---	14.87	14.33	11.49
23	11.65	---	---	19.51	18.81	---	14.41	15.04	---	14.84	14.37	11.46
24	11.75	14.93	19.61	19.53	---	13.34	14.28	15.06	---	14.84	14.36	11.48
25	12.16	15.06	---	19.41	18.13	13.21	14.42	15.07	---	14.87	14.55	11.44
26	11.85	15.02	---	19.38	18.10	13.17	14.50	15.18	---	14.88	14.44	11.56
27	11.75	---	20.10	19.54	---	13.15	14.35	15.20	---	14.93	14.35	11.53
28	11.86	15.04	20.10	19.50	18.71	13.18	14.57	15.11	15.13	14.91	14.35	11.48
29	11.71	15.09	---	---	---	13.21	14.51	15.09	15.09	14.84	14.50	11.46
30	11.86	15.13	20.00	---	---	13.30	14.46	15.07	15.09	14.58	14.48	11.51
31	11.82	---	---	---	---	13.21	---	15.08	---	14.49	14.34	---
MEAN	11.85	---	---	---	---	---	14.24	---	---	14.91	14.37	12.12
MAX	12.16	---	---	---	---	---	14.69	---	---	15.07	14.55	14.44
MIN	11.65	---	---	---	---	---	13.08	---	---	14.49	14.21	11.42

06350000 CANNONBALL RIVER AT REGENT, ND

LOCATION.--Lat 46°25'36", long 102°33'05", in NE¼NE¼ sec.13, T.134 N., R.95 W., Hettinger County, Hydrologic Unit 10130204, on right bank 400 ft from bridge on county highway, and 0.3 mi north of Regent.

DRAINAGE AREA.--580 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 2,422.90 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated discharges: Dec. 11 to Feb. 20, Mar. 11-13, Mar. 17, 18, Mar. 23-27, and Apr. 25 to Sept. 30. Records fair.

AVERAGE DISCHARGE.--40 years, 45.1 ft³/s, 32,670 acre-ft/yr; median of yearly mean discharges, 29 ft³/s, 21,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft³/s, Mar. 27, 1978, gage height, 20.55 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1914, 26.1 ft, Apr. 16, 1950, from floodmarks, discharge, 20,300 ft³/s, on basis of slope-area measurement at site 4 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 1	1415	*64	*3.10				

Minimum daily discharge, no flow, May 24, June 15-18, and July 25-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	5.7	3.5	e2.5	e2.0	59	8.5	e6.2	e2.5	e28	e3.1	e1.3
2	1.6	5.0	3.4	e2.8	e2.0	55	9.4	e6.0	e2.5	e45	e2.0	e1.3
3	1.7	4.8	3.2	e2.8	e1.5	45	9.5	e6.0	e2.5	e20	e1.9	e1.3
4	1.7	4.6	3.3	e2.8	e2.0	37	8.7	e6.0	e2.5	e24	e1.8	e1.3
5	2.2	4.6	3.7	e2.8	e2.5	33	8.4	e6.0	e2.0	e18	e1.8	e1.3
6	2.2	4.1	3.8	e2.8	e3.0	25	7.8	e5.8	e2.0	e15	e1.8	e1.3
7	2.2	4.0	3.3	e2.5	e2.5	22	7.6	e5.8	e2.0	e9.1	e1.6	e1.2
8	2.1	4.2	3.2	e2.5	e3.0	23	7.7	e5.8	e1.5	e5.4	e1.4	e1.1
9	2.3	4.1	3.3	e3.0	e3.0	23	7.7	e5.6	e1.5	e3.4	e.76	e1.0
10	2.1	4.1	3.3	e3.0	e3.0	20	7.4	e5.5	e1.5	e3.0	e.48	e.94
11	2.1	3.9	e2.0	e3.5	e3.0	e20	7.1	e5.2	e1.7	e3.4	e.48	e7.7
12	2.2	3.7	e2.0	e3.0	e4.0	e22	7.0	e4.8	e1.7	e3.2	e.43	e3.2
13	2.2	3.7	e2.0	e3.0	e5.6	e18	6.9	e4.4	e1.7	e3.2	e.39	e2.2
14	2.3	3.9	e2.0	e3.0	e5.0	17	7.1	e4.2	e.70	e3.2	e.39	e1.6
15	2.2	3.9	e1.5	e3.2	e5.0	15	7.4	e4.0	e.00	e3.0	e.30	e1.1
16	2.3	3.6	e1.5	e2.8	e5.0	15	7.5	e3.8	e.00	e3.0	e.30	e.94
17	2.4	3.7	e1.5	e2.6	e4.5	e15	7.2	e3.9	e.00	e3.0	e.61	e1.0
18	2.5	3.6	e1.5	e2.4	e4.0	e16	7.2	e3.5	e.00	e2.8	e1.8	e1.1
19	2.5	3.9	e1.5	e2.3	e5.0	17	7.4	e3.0	e1.2	e1.8	e4.4	e1.1
20	2.7	4.2	e1.0	e2.3	e5.5	19	7.6	e3.0	e1.2	e2.0	e5.4	e1.3
21	3.0	4.3	e1.0	e2.5	6.2	16	7.4	e2.5	e1.0	e2.2	e4.1	e1.2
22	3.1	4.3	e.80	e3.0	7.5	12	7.2	e2.0	e1.1	e1.8	e2.8	e1.4
23	3.1	4.0	e1.0	e3.5	33	e12	7.2	e1.5	e.76	e.54	e2.3	e1.3
24	3.1	3.9	e1.0	e3.5	46	e13	7.2	e.00	e1.6	e.04	e2.0	e1.3
25	3.1	3.9	e1.5	e3.0	39	e12	e7.0	e1.5	e2.2	e.00	e1.9	e1.3
26	3.4	3.9	e1.5	e3.0	41	e11	e6.8	e2.5	e1.6	e.00	e1.9	e1.4
27	13	3.5	e1.5	e3.0	40	e10	e6.6	e3.0	e1.5	e.00	e1.9	e1.4
28	8.2	3.4	e2.0	e3.0	37	9.7	e6.4	e3.0	e1.9	e.00	e1.6	e1.2
29	7.4	3.3	e2.0	e2.8	---	8.8	e6.4	e3.0	e3.4	e.00	e1.4	e1.2
30	6.2	3.6	e2.5	e2.5	---	8.6	e6.2	e3.0	e3.4	e6.3	e1.4	e1.2
31	6.3	---	e2.5	e2.5	---	9.3	---	e2.5	---	e7.1	e1.3	---
TOTAL	103.0	121.4	67.80	87.9	320.8	638.4	223.5	123.00	47.16	217.48	53.74	46.18
MEAN	3.32	4.05	2.19	2.84	11.5	20.6	7.45	3.97	1.57	7.02	1.73	1.54
MAX	13	5.7	3.8	3.5	46	59	9.5	6.2	3.4	45	5.4	7.7
MIN	1.6	3.3	.80	2.3	1.5	8.6	6.2	.00	.00	.00	.30	.94
AC-FT	204	241	134	174	636	1270	443	244	94	431	107	92

CAL YR 1989 TOTAL 4162.84 MEAN 11.4 MAX 241 MIN .00 AC-FT 8260
WTR YR 1990 TOTAL 2050.36 MEAN 5.62 MAX 59 MIN .00 AC-FT 4070

e Estimated

06350000 CANNONBALL RIVER AT REGENT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-66, 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	1210	1.8	1700	--	11.5	10.0	--	--	--	--	--	--
NOV												
14...	1105	3.7	1600	--	2.0	2.0	--	--	--	--	--	--
JAN												
03...	1250	2.8	2280	--	-1.0	0.5	--	--	--	--	--	--
FEB												
13...	1215	5.6	1540	--	-16.0	0.5	--	--	--	--	--	--
28...	1600	43	901	8.0	9.5	0.5	190	37	24	120	55	4
MAR												
20...	1005	18	860	--	12.0	1.0	--	--	--	--	--	--
APR												
03...	1020	8.8	1070	--	14.0	8.5	--	--	--	--	--	--
MAY												
16...	1040	3.8	1580	--	9.5	12.0	--	--	--	--	--	--
JUN												
11...	1720	1.8	1740	--	21.0	24.5	--	--	--	--	--	--
21...	1105	0.84	--	--	22.0	21.0	--	--	--	--	--	--
26...	1110	1.3	1720	--	33.0	26.0	--	--	--	--	--	--
JUL												
03...	1220	16	1520	--	26.0	27.5	--	--	--	--	--	--
12...	0840	4.1	1750	--	19.0	22.5	--	--	--	--	--	--
19...	0840	1.5	1730	--	20.5	21.0	--	--	--	--	--	--
AUG												
03...	0820	1.8	1600	--	19.5	22.0	--	--	--	--	--	--
14...	1145	0.43	1710	8.5	26.0	25.0	330	52	49	280	64	7
23...	1340	2.3	1780	--	31.0	24.5	--	--	--	--	--	--
30...	1200	1.5	1770	--	32.0	23.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
28...	17	210	0	170	290	7.2	0.20	13	638	614	0.87
AUG											
14...	9.0	460	0	380	540	12	0.40	2.9	1190	1170	1.62

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB											
28...	73.4	2	190	260	<1	15	60	<0.1	<1	<1	560
AUG											
14...	1.38	2	620	20	1	43	70	<0.1	2	1	1100

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND

LOCATION.--Lat 46°19'20", long 102°59'45", in NW¼ sec.21, T.133 N., R.98 W., Slope County, Hydrologic Unit 10130205, on left bank 1,200 ft downstream from county highway bridge, and 13 mi northeast of Scranton.

DRAINAGE AREA.--42.9 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1965 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Elevation of gage is 2,825 ft above National Geodetic Vertical Datum from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 8. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--18 years (water years 1966-83), 4.45 ft^3/s, 3,220 acre-ft/yr; median of yearly mean discharges, 4.5 ft^3/s, 3,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 645 ft^3/s, May 8, 1970, gage height, 7.20 ft; maximum gage height, 7.76 ft, May 8, 1967; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 5.0 ft^3/s, sometime during period Feb. 24-27, gage height, 3.60 ft, from flood mark; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e.00	e1.5	.13	.05	.00	.00	.00	.00
2	---	---	---	---	e.00	e1.3	.11	.03	.00	.00	.00	.00
3	---	---	---	---	e.00	e1.1	.11	.03	.00	.00	.00	.00
4	---	---	---	---	e.00	e.80	.06	.04	.00	.00	.00	.00
5	---	---	---	---	e.05	e.60	.04	.05	.00	.00	.00	.00
6	---	---	---	---	e.10	e.40	.02	.03	.00	.00	.00	.00
7	---	---	---	---	e.15	e.35	.01	.03	.00	.00	.00	.00
8	---	---	---	---	e.20	e.30	.01	.01	.00	.00	.00	.00
9	---	---	---	---	e.17	.33	.01	.01	.00	.00	.00	.00
10	---	---	---	---	e.15	.35	.01	.01	.00	.00	.00	.00
11	---	---	---	---	e.20	.41	.02	.01	.00	.00	.00	.00
12	---	---	---	---	e.30	.48	.01	.01	.00	.00	.00	.00
13	---	---	---	---	e.05	.19	.01	.01	.00	.00	.00	.00
14	---	---	---	---	e.00	.17	.01	.01	.00	.00	.00	.00
15	---	---	---	---	e.00	.10	.01	.01	.00	.00	.00	.00
16	---	---	---	---	e.00	.03	.01	.00	.00	.00	.00	.00
17	---	---	---	---	e.00	.03	.01	.01	.00	.00	.00	.00
18	---	---	---	---	e.00	.31	.01	.00	.00	.00	.00	.00
19	---	---	---	---	e.00	.40	.01	.00	.00	.00	.00	.00
20	---	---	---	---	e.00	.32	.01	.00	.00	.00	.00	.00
21	---	---	---	---	e.10	.29	.01	.00	.00	.00	.00	.00
22	---	---	---	---	e.50	.15	.01	.00	.00	.00	.00	.00
23	---	---	---	---	e1.0	.03	.01	.00	.00	.00	.00	.00
24	---	---	---	---	e1.3	.03	.02	.00	.00	.00	.00	.00
25	---	---	---	---	e1.7	.03	.13	.00	.00	.00	.00	.00
26	---	---	---	---	e2.0	.05	.21	.00	.00	.00	.00	.00
27	---	---	---	---	e1.8	.07	.18	.00	.00	.00	.00	.00
28	---	---	---	---	e1.7	.08	.12	.00	.00	.00	.00	.00
29	---	---	---	---	---	.08	.08	.00	.00	.00	.00	.00
30	---	---	---	---	---	.07	.05	.00	.00	.00	.00	.00
31	---	---	---	---	---	.10	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	11.47	10.45	1.44	0.35	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	.41	.34	.048	.011	.000	.000	.000	.000
MAX	---	---	---	---	2.0	1.5	.21	.05	.00	.00	.00	.00
MIN	---	---	---	---	.00	.03	.01	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	23	21	2.9	.7	.00	.00	.00	.00

e Estimated

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
FEB												
28...	1145	1.7	610	7.3	8.0	1.0	200	45	21	44	31	1
MAR												
20...	1515	0.33	1650	--	15.0	4.5	--	--	--	--	--	--
APR												
05...	1515	0.05	1840	--	4.5	9.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
28...	14	140	0	110	190	5.9	0.10	14	426	402	0.58

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB											
28...	1.93	2	190	220	<1	11	400	<0.1	2	<1	740

06352000 CEDAR CREEK NEAR HAYNES, ND

LOCATION.--Lat 46°09'15", long 102°28'25", in W½ sec.20, T.131 N., R.94 W., Adams County, Hydrologic Unit 10130205, on left bank 30 ft downstream from bridge on State Highway 8, and 12.5 mi north of Haynes.

DRAINAGE AREA.--553 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 2,472.90 ft above National Geodetic Vertical Datum of 1929, North Dakota Highway Department benchmark. Prior to May 20, 1951, nonrecording gage on former bridge 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 11 to Mar. 17. Records good except those for period of estimated discharges, which are poor.

AVERAGE DISCHARGE.--40 years, 35.2 ft^3/s, 25,500 acre-ft/yr; median of yearly mean discharges, 28 ft^3/s, 20,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,870 ft^3/s, Apr. 7, 1952, gage height, 21.25 ft; maximum gage height, 22.05 ft, Mar. 28, 1978, backwater from ice and snow; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 17, 1950 reached a stage of about 23 ft, discharge, 26,900 ft^3/s, by slope-area measurement at site 9 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	0915	ice jam	*7.79	Mar. 3	--	*110	ice jam

Minimum daily discharge, 0.11 ft^3/s, Aug. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	3.1	2.5	e2.5	e1.6	e85	8.3	4.3	5.0	.91	.34	.43
2	.76	3.4	2.5	e2.5	e1.5	e80	8.4	3.9	4.3	.82	.35	.43
3	.76	3.1	2.6	e3.0	e1.6	e110	8.1	3.7	3.3	.62	.43	.43
4	.83	3.0	2.5	e3.0	e1.9	e95	7.7	3.8	2.2	.48	.36	.43
5	.89	2.7	2.5	e3.0	e2.3	e80	6.9	4.2	2.0	.46	.41	.43
6	.80	2.7	2.7	e3.0	e2.5	e70	6.5	4.5	1.6	.45	.37	.43
7	.87	2.9	2.8	e3.5	e2.7	e55	5.9	3.3	1.6	.45	.30	.43
8	.87	2.5	2.9	e3.5	e2.5	e50	5.1	2.8	1.4	.43	.25	.40
9	.95	2.1	2.9	e3.0	e2.5	e55	4.4	2.7	1.1	.40	.18	.36
10	1.0	2.3	2.8	e3.5	e2.5	e55	4.2	2.9	.97	.38	.17	.45
11	1.0	2.0	e2.5	e3.5	e7.5	e40	3.9	2.7	.79	.36	.19	.60
12	1.0	2.0	e2.5	e3.0	e15	e33	3.8	2.5	.85	.30	.20	.55
13	.95	1.8	e2.3	e2.5	e20	e28	3.7	2.4	.79	.33	.20	.45
14	.87	1.8	e2.1	e2.5	e30	e30	3.3	2.2	.78	.30	.19	.36
15	.87	2.0	e2.1	e3.0	e40	e27	2.9	2.5	1.3	.27	.13	.41
16	.87	1.6	e2.0	e3.0	e30	e23	2.8	2.6	1.7	.32	.11	.42
17	.99	1.5	e2.0	e2.5	e20	e20	2.7	2.4	2.3	.27	.17	.46
18	1.0	1.6	e2.0	e2.5	e15	24	2.5	2.1	2.8	.24	.24	.48
19	.93	1.8	e1.8	e2.5	e10	20	2.4	2.0	2.6	.25	.29	.43
20	.87	1.8	e1.7	e2.0	e10	18	2.5	2.0	2.0	1.0	.41	.52
21	.87	1.8	e1.6	e2.0	e15	18	2.3	2.0	1.6	17	.59	.52
22	.87	1.8	e1.4	e1.5	e20	16	2.2	1.9	1.3	4.4	.59	.61
23	.87	1.7	e1.2	e2.0	e25	15	2.5	1.7	1.3	1.8	.43	.71
24	.87	1.7	e1.3	e2.5	e50	17	2.4	1.6	1.1	.89	.41	.71
25	.87	1.7	e1.5	e2.0	e95	15	3.8	1.8	1.2	.66	.35	.57
26	1.0	1.7	e1.7	e2.5	e100	13	4.2	1.6	1.0	.62	3.2	.57
27	4.5	2.0	e1.9	e3.0	e105	11	4.2	2.3	.96	.57	1.7	.57
28	7.9	2.3	e2.1	e2.5	e95	10	4.7	2.3	1.0	.80	1.1	.57
29	7.6	2.5	e1.9	e2.5	---	9.8	5.0	2.4	1.0	1.1	.73	.57
30	6.6	2.5	e2.0	e2.2	---	9.6	4.9	4.4	.88	.61	.63	.63
31	4.0	---	e2.0	e1.9	---	9.3	---	4.7	---	.50	.49	---
TOTAL	53.86	65.4	66.3	82.1	724.1	1141.7	132.2	86.2	50.72	37.99	15.51	14.93
MEAN	1.74	2.18	2.14	2.65	25.9	36.8	4.41	2.78	1.69	1.23	.50	.50
MAX	7.9	3.4	2.9	3.5	105	110	8.4	4.7	5.0	17	3.2	.71
MIN	.76	1.5	1.2	1.5	1.5	9.3	2.2	1.6	.78	.24	.11	.36
AC-FT	107	130	132	163	1440	2260	262	171	101	75	31	30

CAL YR 1989 TOTAL 3725.03 MEAN 10.2 MAX 400 MIN .24 AC-FT 7390
WTR YR 1990 TOTAL 2471.01 MEAN 6.77 MAX 110 MIN .11 AC-FT 4900

e Estimated

06352000 CEDAR CREEK NEAR HAYNES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
03...	1625	0.81	1440	--	8.5	9.0	--	--	--	--	--	--
NOV												
14...	1400	1.9	1430	--	1.5	2.5	--	--	--	--	--	--
JAN												
03...	1550	2.9	2180	--	-4.5	0.5	--	--	--	--	--	--
FEB												
13...	1540	20	750	--	-12.0	0.0	--	--	--	--	--	--
MAR												
12...	1340	33	609	7.9	3.0	0.5	170	33	20	67	45	2
20...	1210	21	711	--	17.0	1.0	--	--	--	--	--	--
APR												
03...	1530	7.9	1000	--	18.0	12.0	--	--	--	--	--	--
MAY												
16...	1330	2.7	1560	--	12.0	12.0	--	--	--	--	--	--
22...	1425	2.0	1610	--	27.0	21.5	--	--	--	--	--	--
JUN												
26...	1530	1.1	1620	--	38.0	27.5	--	--	--	--	--	--
AUG												
14...	1510	0.16	1750	9.1	29.0	25.0	330	31	61	300	66	7

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
12...	10	180	0	150	180	5.2	0.20	8.1	422	413	0.57
AUG											
14...	12	410	39	399	600	12	0.40	0.40	1270	1260	1.73

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
12...	37.5	2	160	220	<1	12	40	<0.1	<1	1	460
AUG											
14...	0.55	5	660	30	<1	65	20	<0.1	2	1	740

06353000 CEDAR CREEK NEAR RALEIGH, ND

LOCATION.--Lat 46°05'30", long 101°20'00", in NE¼SE¼ sec.8, T.130 N., R.85 W., Grant County, Hydrologic Unit 10130205, on left bank at upstream side of bridge on N.D. Highway 31, 6 mi upstream from mouth, and 19 mi south of Raleigh.

DRAINAGE AREA.--1,750 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1939, March 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,881.23 ft above National Geodetic Vertical Datum of 1929. Prior to June 6, 1962, nonrecording gage at same site and datum, and June 6, 1962, to Sept. 7, 1972, at site 1 mi upstream at datum 9.58 ft higher.

REMARKS.--Estimated daily discharges: Nov. 13 to Sept. 30. Records fair except those for estimated daily discharges, Nov. 13 to Mar. 5, which are poor.

AVERAGE DISCHARGE.--28 years (water years 1963-90), 96.0 ft³/s, 69,550 acre-ft/yr; median of yearly mean discharges, 79 ft³/s, 57,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft³/s, Mar. 28, 1978, gage height, 13.70 ft; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1950, about 18 ft, Apr. 18, 1950; discharge 45,000 ft³/s, on basis of slope-area measurement 5 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Aug. 18	0645	[a]*850	[b]*5.68	No other peak greater than base discharge.			

No flow for several days.
a - About
b - Backwater from beaver dam

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.06	e.01	e.03	e85	e21	e10	e4.9	e.64	e.18	e.50
2	.00	.00	e.06	e.01	e.03	e105	e21	e8.8	e5.6	e.46	e.14	e.45
3	.00	.00	e.06	e.01	e1.0	e130	e19	e8.9	e5.1	e.30	e.09	e.40
4	.00	.01	e.06	e.01	e9.0	e140	e18	e9.3	e4.6	e.17	e.05	e.20
5	.00	.02	e.06	e.01	e9.7	e133	e18	e9.6	e3.9	e.09	e.03	e.12
6	.00	.03	e.06	e.01	e8.5	e123	e16	e8.8	e3.5	e.06	e.03	e.07
7	.00	.04	e.06	e.02	e8.3	e117	e14	e7.9	e3.5	e.04	e.02	e.03
8	.00	.05	e.05	e.02	e8.1	e113	e13	e7.2	e3.3	e.03	e.01	e.01
9	.00	.05	e.05	e.02	e7.6	e116	e13	e7.1	e2.7	e.02	e.00	e.00
10	.00	.06	e.04	e.03	e6.9	e130	e12	e6.7	e2.9	e.01	e.00	e.00
11	.00	.07	e.04	e.04	e7.0	e133	e12	e6.2	e1.9	e.02	e.00	e.00
12	.00	.07	e.04	e.04	e7.7	e120	e11	e5.8	e1.8	e.42	e.00	e.00
13	.00	e.06	e.04	e.03	e7.5	e115	e11	e5.3	e1.4	e.51	e.00	e.00
14	.00	e.05	e.04	e.04	e5.8	e108	e9.8	e4.6	e1.4	e.32	e.00	e.00
15	.00	e.03	e.04	e.05	e4.5	e97	e8.7	e4.9	e2.2	e.19	e.00	e.00
16	.00	e.04	e.03	e.04	e4.2	e95	e8.0	e5.1	e4.9	e.12	e.00	e.00
17	.00	e.04	e.02	e.03	e4.2	e71	e7.7	e5.4	e6.5	e.07	e.00	e.00
18	.00	e.05	e.02	e.02	e4.4	e58	e7.1	e5.1	e5.4	e.04	e189	e.00
19	.00	e.05	e.00	e.02	e4.7	e49	e6.5	e5.1	e4.4	e.03	e161	e.00
20	.00	e.05	e.01	e.02	e5.5	e46	e7.4	e4.6	e5.6	e.03	e12	e.00
21	.00	e.06	e.00	e.03	e6.4	e46	e7.7	e4.4	e4.4	e.03	e6.5	e.00
22	.00	e.06	e.00	e.05	e13	e51	e8.7	e4.2	e3.5	e.03	e4.4	e.00
23	.00	e.07	e.00	e.06	e21	e54	e10	e3.9	e2.2	e.02	e7.4	e.00
24	.00	e.08	e.02	e.04	e23	e68	e12	e4.2	e1.7	e.02	e11	e.00
25	.00	e.08	e.02	e.03	e26	e39	e12	e5.6	e1.3	e.01	e4.9	e.00
26	.00	e.08	e.02	e.04	e32	e34	e12	e6.2	e.96	e.01	e3.1	e.00
27	.00	e.07	e.01	e.05	e45	e30	e11	e5.1	e.70	e1.6	e1.9	e.00
28	.00	e.06	e.01	e.06	e65	e27	e12	e4.9	e.78	e.87	e1.3	e.00
29	.00	e.06	e.01	e.05	---	e24	e12	e4.6	e.78	e.73	e.96	e.00
30	.00	e.06	e.01	e.06	---	e24	e12	e4.9	e.83	e.48	e.81	e.00
31	.00	---	e.01	e.04	---	e24	---	e4.9	---	e.32	e.67	---
TOTAL	0.00	1.45	0.95	0.99	346.06	2505	363.6	189.3	92.65	7.69	405.49	1.78
MEAN	.000	.048	.031	.032	12.4	80.8	12.1	6.11	3.09	.25	13.1	.059
MAX	.00	.08	.06	.06	65	140	21	10	6.5	1.6	189	.50
MIN	.00	.00	.00	.01	.03	24	6.5	3.9	.70	.01	.00	.00
AC-FT	.00	2.9	1.9	2.0	686	4970	721	375	184	15	804	3.5

CAL YR 1989 TOTAL 9230.16 MEAN 25.3 MAX 800 MIN .00 AC-FT 18310
WTR YR 1990 TOTAL 3914.96 MEAN 10.7 MAX 189 MIN .00 AC-FT 7770

e Estimated

06353000 CEDAR CREEK NEAR RALEIGH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
NOV												
09...	1035	0.05	1700	--	7.5	4.0	--	--	--	--	--	--
DEC												
04...	1015	0.06	2050	--	4.0	1.0	--	--	--	--	--	--
JAN												
04...	1040	0.01	2550	--	-4.5	0.5	--	--	--	--	--	--
FEB												
21...	1210	6.4	3300	--	7.5	0.0	--	--	--	--	--	--
MAR												
06...	1130	123	660	7.8	-3.5	0.5	170	33	22	66	43	2
12...	1340	120	590	--	6.0	1.0	--	--	--	--	--	--
21...	1430	46	740	--	8.0	4.0	--	--	--	--	--	--
MAY												
17...	1105	5.4	1550	--	15.5	11.0	--	--	--	--	--	--
JUN												
27...	1045	0.62	1600	--	27.5	21.5	--	--	--	--	--	--
AUG												
30...	1410	0.89	850	8.5	34.0	24.5	150	31	18	140	65	5

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
06...	15	180	0	150	170	7.0	0.20	8.9	418	411	0.57
AUG											
30...	8.6	280	0	230	250	7.8	0.30	7.4	604	603	0.82

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
06...	139	2	150	270	<1	18	20	0.1	1	<1	490
AUG											
30...	1.45	2	350	30	<1	35	<10	0.1	1	<1	510

06354000 CANNONBALL RIVER AT BREIEN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°22'33", long 100°56'03", in sec.36, T.134 N., R.82 W., Morton County, Hydrologic Unit 10130206, on left bank at downstream side of bridge on State Highway 6, 1,100 ft downstream from Dogtooth Creek, and 0.6 mi southeast of Breien.

DRAINAGE AREA.--4,100 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1934 to current year.

REVISED RECORDS.--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M). WSP 1509: 1955(M).

GAGE.--Water-stage recorder. Datum of gage is 1,673.54 ft above National Geodetic Vertical Datum of 1929. From June 12, 1973, to July 1, 1985, at site 450 ft downstream. Prior to June 12, 1973, at site 50 ft upstream at datum 3.00 ft higher. June 13, 1973, to April 8, 1980, at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 15 to Mar. 26 and Mar. 31 to Apr. 4. Records fair except those for periods of estimated daily discharges, which are poor. Some storage in several small lakes above station.

AVERAGE DISCHARGE.--56 years, 247 ft^3/s, 179,000 acre-ft/yr; median of yearly mean discharges, 182 ft^3/s, 132,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,800 ft^3/s, Apr. 19, 1950, gage height, 22.30 ft, from floodmarks, from rating curve extended above 16,000 ft^3/s on basis of slope area and contracted-opening measurements of peak flow, site and datum then in use; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 3	2400	ice jam	*5.70	Aug. 19	0730	*697	5.36

Minimum daily discharge, 0.10 ft3/s, Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	2.8	e6.7	e.93	e1.0	e25	e70	23	22	92	10	3.0
2	.27	3.1	e6.4	e1.1	e1.1	e33	e62	24	94	37	11	1.9
3	.29	10	e6.8	e.99	e1.4	e46	e55	22	73	21	8.0	1.1
4	.36	12	e6.8	e.90	e1.9	e60	e50	20	52	15	6.5	.71
5	.42	13	e6.3	e.80	e1.9	e81	52	20	40	12	5.4	7.7
6	.42	15	e5.8	e.90	e1.9	e102	54	21	26	9.7	4.4	5.2
7	.51	19	e5.2	e1.0	e2.0	e150	57	20	23	6.5	2.9	1.0
8	.52	22	e5.5	e1.2	e1.9	e200	56	21	22	5.8	1.9	.94
9	.57	21	e4.5	e1.2	e1.9	e300	51	20	19	7.2	1.2	.43
10	.63	20	e3.6	e1.3	e1.8	e280	48	19	18	8.3	1.0	.33
11	.61	16	e2.8	e1.2	e2.0	e270	49	20	14	18	.85	.31
12	.64	16	e2.2	e1.0	e1.7	e260	48	20	13	32	.78	.26
13	.72	15	e1.7	e1.1	e1.4	e225	46	19	9.9	43	.65	.18
14	.68	15	e1.4	e1.2	e1.3	e180	42	19	8.5	17	.47	.16
15	.53	e9.5	e1.5	e1.3	e1.5	e150	39	20	14	12	.31	.13
16	.57	e10	e1.4	e1.3	e1.4	e120	37	21	26	8.7	.18	.12
17	.71	e11	e1.1	e1.2	e1.3	e130	38	19	103	5.9	.11	.10
18	.41	e11	e.75	e1.1	e2.0	e140	40	22	108	5.8	.17	.15
19	.76	e11	e.60	e1.0	e10	e130	35	22	213	5.9	393	.13
20	.96	e8.8	e.76	e.98	e30	e140	33	19	79	7.5	170	.15
21	1.0	e9.7	e.84	e1.1	e27	e150	32	19	43	10	290	.18
22	1.2	e9.2	e.79	e1.3	e25	e140	29	17	25	9.1	186	.18
23	1.2	e8.5	e.85	e1.2	e23	e130	26	16	18	10	106	.19
24	1.2	e11	e1.0	e1.2	e20	e120	26	16	16	8.5	70	.19
25	1.3	e9.9	e.94	e1.1	e29	e123	24	22	13	7.3	63	.18
26	1.6	e8.6	e1.1	e1.4	e28	e128	24	49	11	6.8	41	.18
27	1.8	e7.5	e1.1	e1.3	e27	126	21	58	8.4	25	22	.16
28	1.6	e6.6	e1.0	e1.2	e26	115	21	51	6.7	16	14	.16
29	1.6	e7.3	e1.0	e1.2	---	115	22	27	8.2	15	9.7	.20
30	2.0	e7.2	e1.1	e1.1	---	97	21	19	79	17	6.1	.21
31	2.2	---	e1.0	e1.0	---	e90	---	20	---	13	5.1	---
TOTAL	27.59	346.7	82.53	34.80	274.4	4356	1208	725	1205.7	508.0	1431.72	25.83
MEAN	.89	11.6	2.66	1.12	9.80	141	40.3	23.4	40.2	16.4	46.2	.86
MAX	2.2	22	6.8	1.4	30	300	70	58	213	92	393	7.7
MIN	.27	2.8	.60	.80	1.0	25	21	16	6.7	5.8	.11	.10
AC-FT	55	688	164	69	544	8640	2400	1440	2390	1010	2840	51

CAL YR 1989 TOTAL 21256.19 MEAN 58.2 MAX 1050 MIN .00 AC-FT 42160
WTR YR 1990 TOTAL 10226.27 MEAN 28.0 MAX 393 MIN .10 AC-FT 20280

e Estimated

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1970-72, 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV											
09...	1320	19	1620	--	6.5	4.0	--	--	--	--	--
29...	1005	7.3	2450	8.3	1.0	0.5	4.5	12.3	85	K7	290
JAN											
04...	1405	0.90	3550	--	1.5	0.0	--	--	--	--	--
FEB											
27...	1050	27	1040	7.8	-4.5	0.5	65	11.6	79	K27	3600
MAR											
06...	1355	102	1120	--	3.0	0.5	--	--	--	--	--
12...	1030	260	760	8.3	6.0	1.0	--	--	--	--	--
21...	1115	151	830	--	8.5	1.0	--	--	--	--	--
APR											
04...	1035	49	1180	--	10.0	7.5	--	--	--	--	--
MAY											
17...	1305	19	1630	--	17.5	13.5	--	--	--	--	--
JUN											
25...	1000	11	1300	8.5	29.5	23.5	70	8.1	95	--	--
AUG											
21...	1055	415	500	8.0	25.5	22.0	650	6.5	74	K7800	--
SEP											
24...	1425	0.29	1670	--	27.0	22.0	--	--	--	--	--

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
NOV											
29...	470	63	76	400	64	8	12	--	495	604	0
FEB											
27...	180	32	24	150	63	5	10	--	204	249	0
MAR											
12...	180	35	23	100	53	3	10	190	--	--	--
JUN											
25...	180	38	21	230	72	7	9.2	--	323	375	10
AUG											
21...	61	12	7.4	72	70	4	6.3	--	108	132	0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
NOV											
29...	810	21	0.20	7.3	1700	1690	2.31	33.6	--	0.020	<0.100
FEB											
27...	310	5.3	0.30	11	704	668	0.96	51.3	0.300	0.040	0.340
MAR											
12...	210	7.2	0.30	7.7	508	511	0.69	357	--	--	--
JUN											
25...	300	11	0.50	9.3	888	814	1.21	26.9	--	<0.010	<0.100
AUG											
21...	120	5.8	0.40	4.9	325	296	0.44	364	0.280	0.020	0.300

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
NOV 29...	0.020	0.020	0.60	0.030	<0.010	<0.010	20	<1	<100	10
FEB 27...	0.250	0.190	2.3	1.10	0.140	0.100	170	1	37	<0.5
MAR 12...	--	--	--	--	--	--	--	2	--	--
JUN 25...	0.090	0.021	0.70	0.080	0.010	<0.010	40	2	67	<0.5
AUG 21...	0.060	0.080	1.1	0.420	0.080	<0.010	120	2	11	<0.5

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
NOV 29...	--	<1.0	1	<1	2	30	<1	90	30	0.2
FEB 27...	--	<1.0	<5	<3	<10	600	10	33	38	0.2
MAR 12...	230	--	--	--	--	110	<1	23	10	0.1
JUN 25...	--	<1.0	2	<3	3	46	<1	56	5	0.4
AUG 21...	--	<1.0	2	<3	27	80	1	15	13	<0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 29...	4	4	<1	<1.0	1000	<1	<10	90	1.8	59
FEB 27...	<10	20	<1	4.0	410	<6	13	124	9.0	98
MAR 12...	1	--	1	--	520	--	--	--	--	--
JUN 25...	<10	6	<1	<1.0	520	<6	<3	76	2.3	96
AUG 21...	<10	7	<1	<1.0	190	<6	11	1850	2070	100

06354580 BEAVER CREEK BELOW LINTON, ND

LOCATION.--Lat 46°16'07", long 100°15'05", in NW¼NW¼SW¼ sec.7, T.132 N., R.76 W., Emmons County, Hydrologic Unit 10130104, on left bank 25 ft upstream from bridge on county road, 0.7 mi west of Linton and 0.5 mi downstream from Spring Creek.

DRAINAGE AREA.--765 mi², of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1989 to September 1990. Records for August 1949 to September 1989 at site 1.5 mi upstream published as "at Linton, ND" (station 06354580) are not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder and artificial control. Elevation of gage is 1,690 ft from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-9, Oct. 13 to Nov. 2, Nov. 14, 15, 17, Dec. 11 to Jan. 6, Feb. 27 to Mar. 13, Apr. 22 to May 2, May 25 to June 22, July 10 to Aug. 28, and Aug. 31 to Sept. 30. Records poor.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 6	1200	ice jam	*4.80	Mar. 15	2130	*59	4.71

No flow Aug. 12-19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.0	e2.8	3.2	e1.9	1.8	e12	18	e7.4	e3.3	1.8	e.16	e.30
2	e3.0	e3.0	3.0	e1.9	1.8	e15	16	e7.2	e3.7	3.0	e.14	e.32
3	e3.0	3.2	2.3	e1.9	1.8	e12	15	7.2	e4.2	2.5	e.15	e.31
4	e3.0	3.4	3.0	e1.8	1.8	e11	15	7.1	e4.7	2.0	e.11	e.28
5	e3.0	5.5	3.1	e1.8	1.8	e11	15	7.1	e5.1	1.7	e.09	e.33
6	e3.0	3.9	3.3	e1.9	1.8	e9.5	14	8.6	e4.2	1.3	e.08	e.36
7	e3.0	4.5	3.3	1.9	1.8	e8.3	13	9.1	e4.2	1.3	e.08	e.33
8	e3.0	4.6	3.2	1.9	1.8	e10	13	8.7	e3.8	.99	e.06	e.31
9	e2.8	4.4	3.3	1.9	1.9	e12	12	7.8	e4.0	1.0	e.04	e.29
10	2.8	4.9	2.8	2.1	1.9	e14	12	7.4	e3.7	e.90	e.02	e.27
11	2.9	7.0	e2.2	2.3	1.9	e17	11	7.2	e3.7	e.96	e.01	e.25
12	2.6	3.7	e1.7	2.2	2.1	e20	11	7.2	e3.8	e.86	e.00	e.24
13	e2.8	2.6	e1.2	2.1	2.0	e24	11	6.7	e3.6	e.79	e.00	e.23
14	e2.9	e2.4	e1.1	2.1	1.9	32	11	6.4	e3.3	e.71	e.00	e.21
15	e3.0	e2.2	e1.1	2.1	1.9	45	11	6.6	e3.3	e.68	e.00	e.22
16	e2.9	2.1	e1.0	2.0	1.8	47	11	6.7	e4.1	e.65	e.00	e.21
17	e2.7	e2.3	e.98	2.1	1.5	30	11	6.7	e4.9	e.60	e.00	e.21
18	e2.4	2.8	e1.0	2.1	1.4	27	10	6.7	e3.5	e.57	e.00	e.22
19	e2.3	5.3	e1.1	2.1	1.4	22	9.9	6.1	e3.4	e.54	e.00	e.23
20	e2.4	3.5	e1.2	2.1	1.5	26	9.8	5.7	e3.3	e.50	e.01	e.22
21	e2.6	3.9	e1.2	2.1	2.4	26	9.1	5.3	e3.2	e.46	e.04	e.20
22	e2.7	3.8	e1.3	2.0	11	22	e8.6	5.1	e3.0	e.43	e.10	e.20
23	e2.7	3.3	e1.4	2.1	19	17	e8.1	4.7	2.7	e.40	e.21	e.19
24	e2.8	3.2	e1.5	2.1	22	17	e7.6	4.2	3.3	e.38	e.20	e.18
25	e2.9	3.2	e1.6	2.1	18	18	e7.6	e4.5	1.9	e.33	e.25	e.17
26	e3.2	3.2	e1.7	2.1	14	18	e7.7	e4.7	1.6	e.29	e.34	e.17
27	e3.2	3.3	e1.7	2.1	e14	18	e7.9	e4.9	1.2	e.39	e.32	e.19
28	e3.1	3.2	e1.8	2.1	e13	18	e7.9	e4.8	1.2	e.31	e.30	e.20
29	e3.0	3.2	e1.9	2.1	---	15	e7.8	e4.4	1.3	e.25	.36	e.21
30	e2.9	3.2	e1.9	2.1	---	16	e7.6	e3.9	1.6	e.21	.26	e.22
31	e2.8	---	e1.9	2.0	---	18	---	e3.5	---	e.18	e.28	---
TOTAL	88.4	107.6	60.98	63.1	149.0	607.8	329.6	193.6	98.8	26.98	3.61	7.27
MEAN	2.85	3.59	1.97	2.04	5.32	19.6	11.0	6.25	3.29	.87	.12	.24
MAX	3.2	7.0	3.3	2.3	22	47	18	9.1	5.1	3.0	.36	.36
MIN	2.3	2.1	.98	1.8	1.4	8.3	7.6	3.5	1.2	.18	.00	.17
AC-FT	175	213	121	125	296	1210	654	384	196	54	7.2	14

WTR YR 1990 TOTAL 1736.74 MEAN 4.76 MAX 47 MIN .00 AC-FT 3440

e Estimated

06354580 BEAVER CREEK BELOW LINTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
30...	1330	2.9	1040	--	9.0	7.0	--	--	--	--	--	--
NOV												
27...	1035	3.2	1240	--	<-5.0	1.0	--	--	--	--	--	--
JAN												
10...	1040	2.1	1460	--	6.0	0.5	--	--	--	--	--	--
FEB												
23...	1030	16	1000	--	4.0	0.0	--	--	--	--	--	--
MAR												
13...	1005	24	465	8.1	3.0	1.0	150	34	15	38	33	1
27...	1245	18	680	--	16.0	1.5	--	--	--	--	--	--
MAY												
02...	1315	7.2	930	--	21.0	10.5	--	--	--	--	--	--
JUN												
22...	1320	3.0	1000	--	22.0	19.5	--	--	--	--	--	--
AUG												
28...	1100	0.30	1120	8.2	24.0	23.0	320	71	34	140	48	3
SEP												
26...	0915	0.17	1120	--	17.0	14.0	--	--	--	--	--	--

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
13...	16	180	0	150	92	6.9	0.20	10	305	301	0.41
AUG											
28...	12	480	0	392	240	18	0.20	20	804	771	1.09

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
13...	19.8	2	110	170	<1	54	180	0.2	<1	<1	300
AUG											
28...	0.65	10	330	20	<1	200	60	0.1	<1	1	540

06354988 BOWMAN-HALEY LAKE NEAR HALEY, ND

LOCATION.--Lat 45°59'06", long 103°14'43", in NE¼ sec.24, T.129 N., R.101 W., Bowman County, Hydrologic Unit 10130301, at dam on North Fork Grand River, and 6 mi west of Haley.

DRAINAGE AREA.--446 mi², approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

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, water supply, and recreation.

COOPERATION.--Records of elevations and contents furnished by U.S. Army Corps of Engineers. Elevations affected by wind. Monthend elevations interpolated from furnished readings when necessary. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 37,540 acre-ft, Mar. 28, 1978, elevation, 2,762.66 ft; minimum since first reaching spillway level, 12,660 acre-ft, Sept. 16-20, 1982, elevation, 2,749.93 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 15,460 acre-ft, March 26, elevation, 2,752.72 ft; minimum, 11,880 acre-ft, Sept. 30, elevation, 2,750.04 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,751.91	14,300	--
Oct. 31	2,751.66	13,970	-330
Nov. 30	2,751.69	14,010	+40
Dec. 31	2,751.67	13,980	-30
CAL YR 1989	--	--	+1,080
Jan. 31	2,751.86	14,340	+360
Feb. 28	2,752.42	15,010	+670
Mar. 31	2,752.68	15,410	+400
Apr. 30	2,752.60	15,280	-130
May 31	2,752.29	14,840	-440
June 30	2,752.06	14,510	-330
July 31	2,751.43	13,660	-850
Aug. 31	2,750.66	12,660	-1,000
Sept. 30	2,750.04	11,880	-780
WTR YR 1990	--	--	-2,420

06355000 NORTH FORK GRAND RIVER AT HALEY, ND

LOCATION.--Lat 45°57'39", long 103°07'09", at southwest corner of sec.30, T.129 N., R.99 W., Bowman County, Hydrologic Unit 10130301, on left bank 10 ft downstream from county highway bridge, 300 ft south of post office at Haley, and 1 mi north of South Dakota state line.

DRAINAGE AREA.--509 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1908 to September 1917, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1239: 1908-10, 1913-15(M), 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 2,658.60 ft above National Geodetic Vertical Datum of 1929. 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.

REMARKS.--Estimated daily discharges: Oct. 1 to Sept. 30. Records poor. Flow regulated since August 1966 by Bowman-Haley Lake (station 06354988) 8 mi upstream. There are some small diversions for irrigation.

AVERAGE DISCHARGE.--54 years (water years 1908-17, 1946-90), 25.9 ft^3/s, 18,760 acre-ft/yr; median of yearly mean discharges, 20 ft^3/s, 14,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft^3/s, Apr. 7, 1952, gage height, 17.03 ft, from rating curve extended above 4,500 ft^3/s 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 20 ft^3/s, Feb. 11, gage height, 5.89 ft; backwater from ice; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.7	e1.3	e1.5	e1.1	e1.0	e3.0	e1.3	e4.2	e.76	e.12	e6.2	e1.4
2	e1.8	e1.3	e1.4	e1.2	e.90	e2.5	e1.6	e4.0	e.75	e.03	e6.0	e1.3
3	e2.1	e1.5	e1.3	e1.2	e.90	e2.3	e1.0	e3.8	e.43	e.00	e5.9	e2.0
4	e2.4	e1.5	e1.4	e1.3	e.85	e2.0	e1.1	e3.3	e.49	e.00	e5.5	e2.3
5	e2.6	e1.6	e1.5	e1.2	e.90	e2.0	e.90	e2.8	e.47	e.00	e5.1	e2.4
6	e2.3	e1.6	e1.5	e1.2	e.95	e1.7	e.90	e1.9	e.12	e.00	e4.9	e2.6
7	e1.7	e1.4	e1.5	e1.2	e1.0	e1.7	e1.0	e1.6	e.06	e.00	e4.7	e2.9
8	e1.5	e1.4	e1.4	e1.2	e1.2	e1.8	e1.5	e1.3	e.07	e.00	e4.5	e3.3
9	e1.3	e1.4	e1.3	e1.2	e1.3	e1.8	e2.2	e1.1	e.05	e.00	e4.5	e3.5
10	e1.2	e1.4	e1.2	e1.3	e1.6	e1.9	e2.6	e.99	e.03	e.00	e4.4	e3.7
11	e1.1	e1.5	e1.0	e1.4	e8.0	e1.9	e2.5	e.78	e.04	e.00	e4.3	e3.7
12	e1.1	e1.5	e.80	e1.6	e9.0	e1.8	e2.6	e.60	e.04	e.00	e4.0	e3.7
13	e1.0	e1.4	e.70	e1.4	e5.0	e1.7	e2.9	e.60	e.04	e.00	e3.9	e3.7
14	e1.0	e1.4	e.65	e1.3	e4.0	e1.6	e3.5	e.60	e.04	e.00	e4.0	e3.0
15	e.90	e1.4	e.60	e1.2	e2.5	e1.5	e4.5	e.68	e.05	e.00	e3.6	e2.7
16	e.85	e1.5	e.55	e1.1	e2.0	e1.4	e4.2	e.75	e.05	e.00	e3.2	e2.7
17	e.80	e1.5	e.50	e1.1	e1.5	e2.1	e4.3	e.67	e.06	e.00	e3.3	e2.6
18	e.85	e1.5	e.45	e1.0	e2.0	e2.1	e4.4	e.82	e.07	e.00	e3.4	e1.9
19	e.85	e1.5	e.40	e.95	e2.0	e2.2	e4.6	e.50	e.10	e.00	e4.4	e2.0
20	e.90	e1.6	e.35	e.90	e2.5	e1.8	e4.6	e.52	e.12	e.00	e5.3	e1.8
21	e.95	e1.8	e.30	e.95	e3.0	e1.9	e4.2	e.52	e.12	e.00	e4.8	e1.1
22	e1.0	e1.7	e.25	e1.0	e3.5	e1.2	e4.3	e.42	e.16	e.00	e4.0	e.59
23	e1.0	e1.5	e.30	e1.3	e3.5	e1.1	e3.8	e.27	e.19	e.00	e4.1	e.49
24	e1.1	e1.5	e.40	e1.2	e3.0	e1.1	e4.0	e.23	e.19	e3.4	e3.9	e.45
25	e1.2	e1.6	e.45	e1.1	e2.5	e1.0	e5.5	e.63	e.19	e4.8	e2.4	e.31
26	e1.4	e1.6	e.50	e1.2	e3.5	e.90	e4.4	e.83	e.26	e5.3	e2.4	e.21
27	e1.5	e1.5	e.55	e1.3	e4.1	e.85	e4.4	e.69	e.31	e5.8	e3.4	e.12
28	e1.5	e1.3	e.70	e1.2	e3.5	e.80	e4.1	e.56	e.29	e6.2	e4.2	e.10
29	e1.3	e1.4	e.75	e1.2	---	e.85	e4.4	e.49	e.21	e6.3	e3.8	e.12
30	e1.3	e1.4	e.90	e1.3	---	e.90	e4.6	e.50	e.15	e6.3	e1.5	e.13
31	e1.3	---	e1.0	e1.1	---	e1.1	---	e.72	---	e6.3	e1.3	---
TOTAL	41.50	44.5	26.10	36.90	75.70	50.50	95.90	37.37	5.91	44.55	126.9	56.82
MEAN	1.34	1.48	.84	1.19	2.70	1.63	3.20	1.21	.20	1.44	4.09	1.89
MAX	2.6	1.8	1.5	1.6	9.0	3.0	5.5	4.2	.76	6.3	6.2	3.7
MIN	.80	1.3	.25	.90	.85	.80	.90	.23	.03	.00	1.3	.10
AC-FT	82	88	52	73	150	100	190	74	12	88	252	113

CAL YR 1989 TOTAL 609.95 MEAN 1.67 MAX 12 MIN .00 AC-FT 1210
WTR YR 1990 TOTAL 642.65 MEAN 1.76 MAX 9.0 MIN .00 AC-FT 1270

e Estimated

06355000 NORTH FORK GRAND RIVER AT HALEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
OCT												
05...	1450	2.6	3080	--	15.0	12.0	--	--	--	--	--	--
NOV												
21...	1410	1.9	2750	--	9.0	2.5	--	--	--	--	--	--
JAN												
05...	1155	1.2	3300	--	-3.5	0.5	--	--	--	--	--	--
FEB												
15...	1605	2.5	2440	--	-10.0	0.0	--	--	--	--	--	--
27...	1355	4.1	930	8.0	2.0	1.0	150	30	17	140	65	5
MAR												
21...	1545	1.9	1570	--	7.5	6.0	--	--	--	--	--	--
APR												
05...	1105	0.93	2190	--	2.0	7.0	--	--	--	--	--	--
MAY												
17...	1610	0.80	2960	--	21.0	19.0	--	--	--	--	--	--
JUN												
28...	1110	0.40	3010	--	27.0	26.0	--	--	--	--	--	--
AUG												
15...	1235	3.7	3290	8.3	34.0	24.5	450	63	70	650	75	13

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
27...	13	240	0	140	260	6.4	0.30	5.8	625	591	0.85
AUG											
15...	15	570	0	464	1300	18	0.60	4.3	2490	2400	3.39

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB											
27...	6.89	2	390	130	<1	15	30	<0.1	<1	<1	480
AUG											
15...	24.8	4	1300	30	<1	52	50	<0.1	3	2	1000

06439980 LAKE OAHE NEAR PIERRE, SD

LOCATION.--Lat 44°27'30", long 100°23'29", in NE$^1/_4$ sec.1, T.111 N., R.80 W., 5th principal meridian, Hughes County, Hydrologic Unit 10130105, in Pier A of Control Tower No. 1 of powerhouse intake structure of dam on Missouri River, 6.0 mi northwest of Pierre, 7.1 mi upstream from Bad River, and at mile 1,072.3.

DRAINAGE AREA.--243,500 mi^2, approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 14, 1958, 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.

REVISED RECORDS.--WDR SD-88-1: September monthend elevation.

REMARKS.--Reservoir is formed by an earth-fill dam; storage began in August 1958. Maximum capacity, 23,338,000 acre-ft below elevation, 1,620.0 ft (top of spillway gates). Normal maximum, 22,240,000 acre-ft below 1,617.0 ft, of which about 2,390,000 acre-ft is designated for flood control. Inactive storage, 5,451,000 acre-ft below elevation, 1,540.0 ft. Dead storage, 1,970 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 ft^3/s. The outlet works consist of 7 turbines with a generating capacity of 85,000 kilowatts each. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 22,764,000 acre-ft, May 14, 1986, affected by wind; minimum since initial filling, 12,071,000 acre-ft, Oct. 30, 1989, Nov. 1, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 14,436,000 acre-ft, Mar. 26; minimum contents, 12,071,000 acre-ft, Oct. 30, Nov. 1.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,583.20	12,619,000	--
Oct. 31	1,581.01	12,072,000	-547,000
Nov. 30	1,583.76	12,720,000	+648,000
Dec. 31	1,583.89	12,751,000	+31,000
CAL YR 1989	--	--	-1,237,000
Jan. 31	1,587.81	13,667,000	+916,000
Feb. 28	1,589.52	14,101,000	+434,000
Mar. 31	1,590.72	14,402,000	+301,000
Apr. 30	1,588.82	13,904,000	-498,000
May 31	1,588.05	13,735,000	-169,000
June 30	1,589.18	14,025,000	+290,000
July 31	1,588.19	13,788,000	-237,000
Aug. 31	1,586.09	13,273,000	-515,000
Sept. 30	1,583.49	12,633,000	-640,000
WTR YR 1990	--	--	+14,000

NOTE.--Lake frozen over Feb. 5 to Mar. 12.

06467600 JAMES RIVER NEAR MANFRED, ND

LOCATION.--Lat 47°38'40", long 99°49'40", near midpoint of north line sec.15, T.148 N., R.72 W., Wells County, Hydrologic Unit 10160001, on right upstream wingwall of bridge on county highway, and 5 mi southwest of Manfred.

DRAINAGE AREA.--253 mi^2, of which about 197 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to August 1957 (annual maximum only), September 1957 to current year (seasonal records only from 1982 to 1985).

GAGE.--Water-stage recorder. Datum of gage is 1,605.73 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 16, 1957, crest-stage gage only on downstream side of bridge at same datum.

REMARKS.--Estimated daily discharges: Oct 4 to Mar. 19 and Sept. 26-30. Records good.

AVERAGE DISCHARGE.--30 years (water years 1958-82, 1986 to current year), 3.93 ft^3/s, 2,850 acre-ft/yr; median of yearly mean discharges, 3.4 ft^3/s, 2,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 2,000 ft^3/s, Apr. 18 or 19, 1979, gage height, 9.2 ft, from highwater mark, backwater from snow; no flow for long periods each year.

EXTREMES FOR CURRENT YEAR.--No flow Oct. 1 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
2	.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
3	.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
4	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
5	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
6	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
7	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
8	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
9	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
10	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
11	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
12	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
13	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
14	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
15	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
16	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
17	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
18	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
19	e.00	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00
20	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
21	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
22	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
23	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
24	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
25	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
26	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	e.00
27	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	e.00
28	e.00	e.00	e.00	e.00	e.00	.00	.00	.00	.00	.00	.00	e.00
29	e.00	e.00	e.00	e.00	---	.00	.00	.00	.00	.00	.00	e.00
30	e.00	e.00	e.00	e.00	---	.00	.00	.00	.00	.00	.00	e.00
31	e.00	---	e.00	e.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1989 TOTAL 150.66 MEAN .41 MAX 20 MIN .00 AC-FT 299
WTR YR 1990 TOTAL 0.00 MEAN .000 MAX .00 MIN .00 AC-FT .00

e Estimated

06468170 JAMES RIVER NEAR GRACE CITY, ND

LOCATION.--Lat 47°33'29", long 98°51'45", in $NW^1/_4NW^1/_4NW^1/_4$ sec.17, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank on upstream side of county highway bridge and 2.5 mi northwest of Grace City.

DRAINAGE AREA.--1,060 mi^2, approximately, of which about 650 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,457.60 ft, above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 12 to Jan. 7 and Feb. 23 to Apr. 17. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--22 years, 28.7 ft^3/s, 20,790 acre-ft/yr; median of yearly mean discharges, 19 ft^3/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,100 ft^3/s, Apr. 13, 1969, gage height, 12.00 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 29	0100	*294	*6.71	No other peak greater than base discharge.			

No flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.06	.37	e.00	.00	e.00	e.50	.36	.03	60	.75	.00
2	.00	.06	.36	e.00	.00	e.00	e1.0	.36	.31	36	.71	.00
3	.00	.08	.39	e.00	.00	e.00	e2.0	.36	.57	22	.64	.00
4	.00	.20	.42	e.00	.00	e.00	e2.5	.36	.63	13	.54	.00
5	.00	.30	.42	e.00	.00	e.00	e3.0	.36	.63	8.9	.48	.00
6	.00	.30	.30	e.00	.00	e.00	e2.5	.39	.54	7.8	.48	.00
7	.00	.30	.30	e.00	.00	e.00	e2.0	.39	.50	6.2	.43	.10
8	.00	.32	.30	.00	.00	e.00	e2.2	.36	.53	4.4	.41	.10
9	.00	.24	.27	.00	.00	e.30	e2.5	.31	.50	3.0	.36	.12
10	.00	.18	.15	.00	.00	e.60	e4.0	.30	.52	2.7	.29	.12
11	.00	.18	.10	.00	.00	e1.0	e3.5	.30	.54	2.8	.18	.12
12	.00	.06	e.05	.00	.00	e.90	e3.0	.32	.48	2.4	.18	.05
13	.00	.06	e.00	.00	.00	e.85	e2.0	.32	.47	2.3	.18	.00
14	.00	.06	e.00	.00	.00	e.80	e1.0	.30	.48	2.0	.18	.00
15	.00	.05	e.00	.00	.00	e.70	e.80	.33	.54	1.9	.18	.00
16	.00	.05	e.00	.00	.00	e.60	e.50	.35	.63	1.8	.11	.00
17	.00	.10	e.00	.00	.00	e.50	e.40	.17	.73	1.7	.05	.00
18	.00	.00	e.00	.00	.00	e.40	.38	.11	.78	1.4	.00	.06
19	.00	.08	e.00	.00	.00	e.30	.37	.18	.95	1.4	.00	.07
20	.00	.18	e.00	.00	.00	e.20	.36	.18	.89	1.5	.07	.16
21	.00	.18	e.00	.00	.00	e.19	.36	.18	.86	1.5	.12	.36
22	.00	.18	e.00	.00	.00	e.18	.36	.10	.88	1.2	.11	.36
23	.00	.18	e.00	.00	e.00	e.18	.36	.00	.84	1.1	.06	.36
24	.00	.25	e.00	.00	e.00	e.17	.36	.03	.84	1.1	.08	.38
25	.00	.31	e.00	.00	e.00	e.17	.39	.05	.81	1.1	.21	.36
26	.00	.30	e.00	.00	e.00	e.16	.36	.13	.78	1.1	.24	.31
27	.20	.30	e.00	.00	e.00	e.16	.32	.16	2.6	1.1	.24	.23
28	.22	.27	e.00	.00	e.00	e.15	.35	.05	155	.96	.22	.18
29	.06	.40	e.00	.00	---	e.15	.36	.00	221	.89	.11	.18
30	.06	.42	e.00	.00	---	e.15	.36	.00	107	.84	.06	.22
31	.06	---	e.00	.00	---	e.20	---	.00	---	.79	.05	---
TOTAL	0.60	5.65	3.43	0.00	0.00	9.01	38.09	6.81	501.86	194.88	7.72	3.84
MEAN	.019	.19	.11	.000	.000	.29	1.27	.22	16.7	6.29	.25	.13
MAX	.22	.42	.42	.00	.00	1.0	4.0	.39	221	60	.75	.38
MIN	.00	.00	.00	.00	.00	.00	.32	.00	.03	.79	.00	.00
AC-FT	1.2	11	6.8	.00	.00	18	76	14	995	387	15	7.6

CAL YR 1989 TOTAL 478.43 MEAN 1.31 MAX 80 MIN .00 AC-FT 949
WTR YR 1990 TOTAL 771.89 MEAN 2.11 MAX 221 MIN .00 AC-FT 1530

e Estimated

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
APR												
03...	1600	2.1	1000	8.0	17.0	4.0	--	--	--	140	31	16
MAY												
21...	1500	0.20	1660	8.5	22.0	16.0	15	15.6	156	200	33	29
JUL												
09...	1430	3.0	640	8.6	28.0	25.0	1.4	12.0	143	190	38	22
AUG												
13...	1400	0.15	1200	8.9	28.0	17.0	2.5	4.8	49	190	26	30

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
APR												
03...	180	72	7	7.0	290	33	295	130	58	0.20	8.7	619
MAY												
21...	320	76	10	11	--	--	532	230	110	--	--	1090
JUL												
09...	65	42	2	10	--	--	260	68	22	--	--	406
AUG												
13...	210	69	7	11	--	--	376	170	79	--	--	786

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
APR											
03...	608	0.84	3.43	--	--	--	--	--	--	--	--
MAY											
21...	1050	1.48	0.59	47	<0.010	<0.010	<0.100	<0.100	0.040	0.040	2.8
JUL											
09...	382	0.55	3.27	3	--	<0.010	--	<0.100	--	0.070	--
AUG											
13...	752	1.07	0.32	4	<0.010	<0.010	<0.100	<0.100	0.050	0.040	1.7

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)
APR											
03...	--	--	--	--	--	--	2	200	--	--	--
MAY											
21...	1.5	0.330	0.070	0.084	0.037	<1	3	410	<1	<10	1
JUL											
09...	0.70	--	0.280	--	0.202	--	4	160	--	<10	<1
AUG											
13...	1.3	0.210	0.210	0.158	0.150	4	3	330	<1	<10	1

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 03...	--	70	<10	45	--	330	0.5	<10	--	<1	300
MAY 21...	910	28	<1	--	330	88	0.2	--	<1	<1	--
JUL 09...	--	24	<1	--	--	29	0.2	--	--	<1	--
AUG 13...	60	14	<1	--	140	75	0.4	--	<1	<1	--

DATE	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)	PLANK-TON BIOMASS ASH WT (MG/L) (81353)	PLANK-TON BIOMASS DRY WT (MG/L) (81354)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAY 21...	5	22	<0.010	<0.01	17.0	<0.300	17	1100	27	0.02	71
JUL 09...	3	--	--	<0.01	--	--	--	--	10	0.08	78
AUG 13...	<3	17	<0.010	<0.01	1.20	<0.600	16	1300	2	0.00	50

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

LOCATION.--Lat 47°23'59", long 98°47'50", in $SW^1/_4SW^1/_4SW^1/_4$ sec.2, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160003, on left bank 20 ft upstream from bridge.

DRAINAGE AREA.--1,200 mi^2, approximately, of which about 750 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,440.00 ft above National Geodetic Vertical Datum of 1929, from topographc map.

AVERAGE DISCHARGE.--5 years, 21.4 ft^3/s, 15,500 acre-ft/yr.

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 5. Records fair except those for period of estimated discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s, Mar. 28, 1987, gage height 11.48 ft, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
July 3	1545	*113	*3.36				

No flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.03	e.00	e.00	e.00	e4.5	3.8	1.7	6.7	.86	.00
2	.00	.00	e.03	e.00	e.00	e.00	e4.2	3.5	2.9	45	.67	.00
3	.00	.00	e.03	e.00	e.00	e.00	e4.0	3.2	4.5	104	.54	.00
4	.00	.00	e.02	e.00	e.00	e.00	e3.8	3.2	5.3	105	.39	.00
5	.00	.00	e.02	e.00	e.00	e.00	e7.0	3.1	5.7	84	.26	.00
6	.00	.00	e.02	e.00	e.00	e.00	6.1	3.1	5.8	55	.20	.00
7	.00	e.01	e.02	e.00	e.00	e.00	5.1	3.1	5.1	38	.15	.00
8	.00	e.02	e.02	e.00	e.00	e.00	4.3	2.6	4.3	26	.10	.00
9	.00	e.08	e.01	e.00	e.00	e.00	3.6	2.1	4.0	17	.02	.00
10	.00	e.10	e.01	e.00	e.00	e.00	3.3	2.0	3.5	11	.00	.00
11	.00	e.12	e.01	e.00	e.00	e.05	3.2	2.0	3.2	9.7	.00	.00
12	.00	e.12	e.00	e.00	e.00	e.10	2.9	2.2	2.9	8.2	.00	.00
13	.00	e.12	e.00	e.00	e.00	e.20	3.0	2.0	2.8	7.4	.00	.00
14	.00	e.10	e.00	e.00	e.00	e.30	3.1	1.8	2.4	6.9	.00	.00
15	.00	e.08	e.00	e.00	e.00	e.30	3.0	1.8	2.2	6.1	.00	.00
16	.00	e.06	e.00	e.00	e.00	e.20	2.8	2.4	2.2	5.5	.00	.00
17	.00	e.06	e.00	e.00	e.00	e.15	2.7	3.0	2.2	5.0	.00	.00
18	.00	e.06	e.00	e.00	e.00	e.10	2.9	3.0	2.2	4.6	.00	.00
19	.00	e.06	e.00	e.00	e.00	e.05	3.3	2.9	2.9	3.9	.00	.00
20	.00	e.06	e.00	e.00	e.00	e.01	3.2	2.4	3.4	3.8	.00	.00
21	.00	e.05	e.00	e.00	e.00	e.01	2.8	2.0	3.6	3.6	.00	.00
22	.00	e.05	e.00	e.00	e.00	e.00	2.4	1.5	3.2	3.2	.00	.00
23	.00	e.05	e.00	e.00	e.00	e.00	2.3	1.4	3.0	3.3	.00	.00
24	.00	e.05	e.00	e.00	e.00	e.00	2.7	1.7	2.9	3.1	.00	.00
25	.00	e.05	e.00	e.00	e.00	e.00	3.2	1.8	2.6	3.0	.00	.00
26	.00	e.05	e.00	e.00	e.00	e.00	3.2	1.9	2.3	2.9	.00	.00
27	.00	e.05	e.00	e.00	e.00	e.00	3.2	2.1	2.9	2.7	.00	.00
28	.00	e.04	e.00	e.00	e.00	e.00	3.4	2.2	4.1	2.4	.00	.00
29	.00	e.03	e.00	e.00	---	e.00	3.7	2.2	4.7	2.0	.00	.00
30	.00	e.03	e.00	e.00	---	e.10	3.8	2.1	5.4	1.6	.00	.00
31	.00	---	e.00	e.00	---	e5.0	---	1.8	---	1.2	.00	---
TOTAL	0.00	1.50	0.22	0.00	0.00	6.57	106.7	73.9	103.9	581.8	3.19	0.00
MEAN	.000	.050	.007	.000	.000	.21	3.56	2.38	3.46	18.8	.10	.000
MAX	.00	.12	.03	.00	.00	5.0	7.0	3.8	5.8	105	.86	.00
MIN	.00	.00	.00	.00	.00	.00	2.3	1.4	1.7	1.2	.00	.00
AC-FT	.00	3.0	.4	.00	.00	13	212	147	206	1150	6.3	.00

CAL YR 1989 TOTAL 918.89 MEAN 2.52 MAX 59 MIN .00 AC-FT 1820
WTR YR 1990 TOTAL 877.78 MEAN 2.40 MAX 105 MIN .00 AC-FT 1740

e Estimated

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
NOV 30...	1400	0.03	1240	7.5	2.0	0.5	0.50	7.2	49	420	79	55
APR 03...	1800	3.9	410	7.9	17.0	2.5	2.4	9.8	71	150	33	16
MAY 21...	1300	2.3	1060	7.8	18.0	14.0	0.60	7.9	76	320	58	43
JUL 09...	1630	17	1010	7.6	29.0	25.0	1.2	9.8	117	180	24	29

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)
NOV 30...	110	35	2	16	422	230	29	808	773	1.10	0.06	6
APR 03...	25	25	0.9	10	140	55	6.2	276	230	0.38	2.89	15
MAY 21...	110	42	3	10	352	200	36	715	669	0.97	4.36	1
JUL 09...	150	63	5	12	316	140	55	668	601	0.91	30.8	1

DATE	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P) (70507)
NOV 30...	--	--	<0.010	--	<0.100	--	0.040	--	1.0	--	0.050	--
APR 03...	0.080	--	0.020	--	0.100	--	0.030	--	1.1	--	0.160	--
MAY 21...	--	<0.010	<0.010	<0.100	<0.100	0.030	0.110	1.0	1.1	0.110	0.080	0.060
JUL 09...	--	--	<0.010	--	<0.100	--	0.030	--	1.3	--	0.340	--

DATE	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
NOV 30...	0.025	--	1	260	--	<1.0	<1	--	46	<1	--	140
APR 03...	0.135	--	1	60	--	<1.0	<10	--	67	<10	--	270
MAY 21...	0.066	2	1	230	<1	<10	<1	90	14	<1	50	23
JUL 09...	0.275	--	3	290	--	<10	<1	--	39	<1	--	24

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	ALDRIN, DIS-SOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AME-TRYNE TOTAL (82184)	ATRA-ZINE, TOTAL (UG/L) (39630)
NOV 30...	0.1	--	<1	<3	--	--	<0.01	--	--	--	--	--
APR 03...	0.2	--	<1	9	--	--	<0.01	--	--	--	--	--
MAY 21...	0.7	<1	<1	6	15	<0.010	<0.01	<0.10	<0.01	<0.010	<0.10	<0.10
JUL 09...	0.2	--	<1	9	--	--	<0.01	--	--	--	--	--

DATE	CHLOR-DANE, DIS-SOLVED (UG/L) (39352)	CHLOR-DANE, TOTAL (UG/L) (39350)	CYAN-AZINE TOTAL (UG/L) (81757)	DDD, DIS-SOLVED (UG/L) (39361)	DDD, TOTAL (UG/L) (39360)	DDE, DIS-SOLVED (UG/L) (39366)	DDE, TOTAL (UG/L) (39365)	DDT, DIS-SOLVED (UG/L) (39371)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)
MAY 21...	<0.1	<0.1	<0.10	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01

DATE	DI-ELDRIN TOTAL (UG/L) (39380)	ENDO-SULFAN DISSOLV (UG/L) (82354)	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, DIS-SOLVED (UG/L) (39391)	ENDRIN, TOTAL (UG/L) (39390)	ETHION DISSOLV (UG/L) (82346)	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, DIS-SOLVED (UG/L) (39411)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE DIS-SOLVED (UG/L) (39421)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE DIS-SOLVED (UG/L) (39341)
MAY 21...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01

DATE	LINDANE TOTAL (UG/L) (39340)	MALA-THION, DIS-SOLVED (UG/L) (39532)	MALA-THION, TOTAL (UG/L) (39530)	METHO-MYL TOTAL (UG/L) (39051)	METH-OXY-CHLOR DISSOLV (UG/L) (82350)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, DIS-SOLVED (UG/L) (39602)	METHYL PARA-THION, TOTAL (UG/L) (39600)	METHYL-TRI-THION DISSOLV (UG/L) (82344)	METHYL TRI-THION, TOTAL (UG/L) (39790)	METOLA-CHLOR WATER WHOLE TOT.REC (UG/L) (82612)	METRI-BUZIN WATER WHOLE TOT.REC (UG/L) (82611)
MAY 21...	<0.010	<0.01	<0.01	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1

DATE	MIREX, DIS-SOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)	PARA-THION, DIS-SOLVED (UG/L) (39542)	PARA-THION, TOTAL (UG/L) (39540)	PCB, DIS-SOLVED (UG/L) (39517)	PCB, TOTAL (UG/L) (39516)	PCN DISSOLV (UG/L) (82360)	PER-THANE DISSOLV (UG/L) (82348)	PER-THANE TOTAL (UG/L) (39034)	PHORATE OTAL (UG/L) (39023)	PROME-TONE TOTAL (UG/L) (39056)
MAY 21...	<0.01	<0.01	<0.10	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1

DATE	PROME-TRYNE TOTAL (UG/L) (39057)	PRO-PAZINE TOTAL (UG/L) (39024)	PROPHAM TOTAL (UG/L) (39052)	SEVIN, TOTAL (UG/L) (39750)	SILVEX, TOTAL (UG/L) (39760)	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)	TOX-APHENE, DIS-SOLVED (UG/L) (39401)	TOX-APHENE, TOTAL (UG/L) (39400)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	TRI-THION DISSOLV (UG/L) (82342)
MAY 21...	<0.1	<0.10	<0.5	<0.50	<0.01	<0.10	<0.1	<1.0	<1	<0.10	<0.01

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TOTAL TRI-THION (UG/L) (39786)	2,4-D, TOTAL (UG/L) (39730)	2,4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)	PLANK-TON BIOMASS ASH WT (MG/L) (81353)	PLANK-TON BIOMASS DRY WT (MG/L) (81354)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV											
30...	--	--	--	--	--	--	--	--	46	0.00	13
APR											
03...	--	--	--	--	--	--	--	--	4	0.04	44
MAY											
21...	<0.01	0.02	<0.01	<0.01	<0.100	<0.200	9.0	1100	35	0.21	4
JUL											
09...	--	--	--	--	--	--	--	--	30	1.4	12

DATE	1-NAPH-THOL (UG/L) (LC1351a)	3-HYDRO-XYCARBO-FURAN (UG/L) (LC1353a)	ALDI-CARB (UG/L) (LC1338a)	ALDICARB SULFONE (UG/L) (LC1344a)	ALDICARB SULFOXIDE (UG/L) (LC1343a)	CARBARYL (UG/L) (LC0636a)	CARBO-FURAN (UG/L) (LC1337a)	METHOMYL TOTAL (UG/L) (LC0638a)	OXAMYL (UG/L) (LC1335a)	PROPHAM TOTAL (UG/L) (LC0637a)
MAY										
21...	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

a - Lab Code. WATSTORE parameter code unavailable.

06468360 ARROWWOOD LAKE OPEN-WATER SITE

LOCATION.--Lat 47°16'46", long 98°50'05", in SW¼NE¼ sec.19, T.144 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, in open-water area near center of lake about 1.5 mi northeast of Arrowwood National Wildlife Refuge headquarters, and about 5 mi southwest of Kensal.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1987 to current year.

INSTRUMENTATION.--Water-quality monitor since November 1987.

REMARKS.--Records of daily air and water temperature, specific conductance, dissolved oxygen, pH, relative humidity, solar radiation, and wind speed and direction are available in files at the District office. These daily records will be published in a separate report.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)
APR												
30...	1230	800	9.1	-1.0	4.5	14.6	--	0.020	--	0.020	--	0.180
MAY												
07...	1030	825	8.8	19.0	15.0	11.8	--	<0.010	--	<0.010	--	0.250
22...	1200	900	9.1	23.0	16.0	9.0	<0.01	--	0.010	--	0.010	--
JUN												
05...	1000	930	8.3	17.0	14.5	9.0	--	--	<0.010	--	0.040	--
19...	1000	870	8.9	19.0	21.0	10.1	<0.01	--	0.010	--	0.010	--
JUL												
03...	1000	880	9.4	27.0	28.0	9.9	--	--	<0.010	--	<0.010	--
17...	1050	900	9.7	20.0	22.0	10.5	--	--	<0.010	--	0.010	--
24...	0830	930	9.9	20.0	21.0	14.3	--	--	<0.010	--	<0.010	--
24...	1000	933	9.9	22.0	21.0	16.0	--	--	<0.010	--	<0.010	--
24...	1200	936	9.9	25.0	22.0	16.2	--	--	<0.010	--	<0.010	--
24...	1310	931	9.9	26.0	22.5	16.4	--	--	<0.010	--	<0.010	--
24...	1400	940	9.9	27.0	22.5	16.7	--	--	<0.010	--	<0.010	--
24...	1500	941	9.9	27.5	23.0	16.8	--	--	<0.010	--	<0.010	--
24...	1600	962	9.9	28.0	23.5	17.3	--	--	<0.010	--	<0.010	--
24...	1700	965	9.8	28.0	24.0	18.0	--	--	<0.010	--	<0.010	--
24...	1800	933	9.9	28.5	24.0	17.7	--	--	<0.010	--	<0.010	--
24...	1900	961	9.9	28.0	24.0	17.0	--	--	<0.010	--	<0.010	--
24...	2000	968	9.9	28.0	24.5	17.4	--	--	<0.010	--	<0.010	--
24...	2100	958	9.9	24.5	24.5	17.4	--	--	<0.010	--	<0.010	--
24...	2200	962	9.9	21.5	24.0	17.2	--	--	<0.010	--	<0.010	--
24...	2300	947	9.9	21.5	23.5	16.2	--	--	<0.010	--	<0.010	--
24...	2400	942	9.8	21.0	23.0	15.9	--	--	<0.010	--	<0.010	--
25...	0200	955	9.8	19.5	23.0	15.4	--	--	<0.010	--	<0.010	--
25...	0400	951	9.8	20.0	22.5	14.9	--	--	<0.010	--	<0.010	--
25...	0500	930	9.7	20.0	22.5	15.0	--	--	<0.010	--	<0.010	--
25...	0600	923	9.8	18.5	22.5	13.9	--	--	<0.010	--	<0.010	--
25...	0700	932	9.8	18.5	22.0	13.2	--	--	<0.010	--	<0.010	--
25...	0800	929	9.7	18.5	22.0	12.7	--	--	<0.010	--	<0.010	--
25...	0900	929	9.8	19.5	22.0	12.2	--	--	<0.010	--	<0.010	--
25...	1000	922	9.7	19.5	22.0	12.0	--	--	<0.010	--	<0.010	--
25...	1100	913	9.8	20.0	22.0	11.9	--	--	<0.010	--	<0.010	--

06468360 ARROWWOOD LAKE OPEN-WATER SITE--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR. (UG/L) (32230)	CHLOROPHYLL A PHYTOPLANKTON, CORR. (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR. (UG/L) (32231)	CHLOROPHYLL C PHYTOPLANKTON, UNCORR. (UG/L) (32232)
APR											
30...	--	1.4	--	0.510	--	0.110	--	193	155	<0.10	33.2
MAY											
07...	--	0.91	--	0.890	--	0.120	--	174	158	<0.10	29.1
22...	0.180	--	2.6	--	0.150	--	0.080	--	--	--	--
JUN											
05...	0.130	--	1.7	--	0.270	--	0.270	14.3	8.0	6.30	4.80
19...	0.090	--	--	--	0.090	--	0.040	28.6	50.7	25.2	18.8
JUL											
03...	<0.010	--	--	--	0.330	--	0.230	9.10	18.7	6.80	5.10
17...	0.070	--	--	--	0.370	--	0.300	5.50	5.3	1.90	3.40
24...	0.040	--	--	--	0.260	--	0.170	14.5	8.0	16.3	22.1
24...	0.030	--	--	--	0.270	--	0.170	2.20	<0.1	0.800	1.40
24...	0.030	--	--	--	0.260	--	0.150	2.20	1.3	0.800	1.40
24...	0.040	--	--	--	0.250	--	0.180	3.80	1.3	1.90	1.60
24...	0.030	--	--	--	0.270	--	0.170	4.30	1.3	3.90	<0.10
24...	0.040	--	--	--	0.230	--	0.190	3.80	4.0	3.10	0.200
24...	0.050	--	--	--	0.220	--	0.190	4.30	1.3	3.90	<0.10
24...	0.030	--	--	--	0.230	--	0.180	5.50	6.7	3.30	<0.10
24...	0.020	--	--	--	0.220	--	0.200	6.00	6.7	3.10	<0.10
24...	0.040	--	--	--	0.270	--	0.210	3.90	1.3	1.00	0.700
24...	0.030	--	--	--	0.260	--	0.220	4.90	2.7	3.60	<0.10
24...	0.040	--	--	--	0.260	--	0.210	5.40	5.3	4.10	1.70
24...	0.030	--	--	--	0.260	--	0.210	2.80	2.7	0.500	1.30
24...	0.040	--	--	--	0.260	--	0.220	2.20	2.7	0.800	1.40
24...	0.030	--	--	--	0.250	--	0.210	2.70	2.7	1.50	0.900
25...	0.040	--	--	--	0.250	--	0.220	2.70	2.7	1.50	0.900
25...	0.040	--	--	--	0.280	--	0.250	2.10	4.0	1.80	1.00
25...	0.050	--	--	--	0.270	--	0.230	3.20	2.7	2.30	0.400
25...	0.050	--	--	--	0.270	--	0.250	2.20	1.3	0.800	1.40
25...	0.050	--	--	--	0.270	--	0.240	2.70	2.7	1.50	0.900
25...	0.040	--	--	--	0.270	--	0.250	2.10	2.7	1.80	1.00
25...	0.030	--	--	--	0.360	--	0.240	2.70	1.3	1.53	0.900
25...	0.020	--	--	--	0.280	--	0.260	4.60	2.7	3.10	0.900
25...	0.030	--	--	--	0.280	--	0.240	--	--	--	--

06468380 ARROWWOOD LAKE OUTFLOW SITE

LOCATION.--Lat 47°15'55", long 98°50'52", in SE¼NE¼ sec.25, T.144 N., R.65 W., Stutsman County, Hydrologic Unit 10160001, in downstream end of the lake, about 0.2 mi east of Arrowwood National Wildlife Refuge headquarters, and about 6 mi southwest of Kensal.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1987 to current year.

INSTRUMENTATION.--Water-quality monitor since November 1987.

REMARKS.--Records of daily air and water temperature, specific conductance, dissolved oxygen, pH, relative humidity, solar radiation, and wind speed and direction are available in files at the District office. These daily records will be published in a separate report.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)
APR												
30...	1200	790	9.1	-1.0	5.0	14.6	--	0.010	--	0.020	--	0.170
MAY												
07...	1130	840	9.1	21.5	15.5	11.4	--	0.010	--	0.010	--	0.470
22...	1100	935	9.1	22.5	16.0	8.4	<0.01	--	0.010	--	0.010	--
JUN												
05...	1100	870	8.3	18.0	15.5	9.5	--	--	<0.010	--	<0.010	--
19...	1100	810	9.7	20.5	21.5	12.8	<0.01	--	0.010	--	0.010	--
JUL												
03...	1100	840	10.3	30.0	27.5	9.4	--	--	<0.010	--	<0.010	--
17...	1145	860	10.4	21.5	22.5	10.7	--	--	<0.010	--	0.010	--
23...	0840	860	10.0	20.5	20.5	11.2	--	--	<0.010	--	<0.010	--
24...	1015	872	10.2	22.0	20.5	11.3	--	--	<0.010	--	<0.010	--
24...	1210	864	10.2	25.0	21.5	12.7	--	--	<0.010	--	<0.010	--
24...	1300	867	10.2	26.5	22.5	12.9	--	--	<0.010	--	<0.010	--
24...	1410	879	10.2	27.0	23.0	13.5	--	--	<0.010	--	<0.010	--
24...	1510	906	10.2	28.0	23.5	14.2	--	--	<0.010	--	<0.010	--
24...	1610	904	10.2	28.5	24.5	14.2	--	--	<0.010	--	<0.010	--
24...	1710	902	10.2	28.0	24.5	14.2	--	--	<0.010	--	<0.010	--
24...	1810	921	10.3	28.0	24.5	14.7	--	--	<0.010	--	<0.010	--
24...	1900	897	10.2	27.5	24.5	14.8	--	--	<0.010	--	<0.010	--
24...	2000	904	10.3	26.5	24.0	14.9	--	--	<0.010	--	<0.010	--
24...	2100	906	10.3	23.5	24.0	14.7	--	--	<0.010	--	<0.010	--
24...	2200	898	10.3	22.0	23.5	14.3	--	--	<0.010	--	<0.010	--
24...	2300	910	10.3	20.0	23.0	14.0	--	--	<0.010	--	<0.010	--
24...	2400	906	10.3	23.0	23.0	13.6	--	--	<0.010	--	<0.010	--
25...	0200	891	10.3	19.0	22.5	13.0	--	--	<0.010	--	<0.010	--
25...	0400	887	10.2	19.5	22.0	11.6	--	--	<0.010	--	<0.010	--
25...	0500	875	10.2	19.5	22.0	11.3	--	--	<0.010	--	<0.010	--
25...	0600	868	10.2	18.0	21.5	10.5	--	--	<0.010	--	<0.010	--
25...	0700	846	10.2	18.0	21.5	10.1	--	--	0.010	--	<0.010	--
25...	0800	867	10.2	18.5	21.5	9.5	--	--	<0.010	--	<0.010	--
25...	0900	863	10.1	19.0	21.0	9.3	--	--	<0.010	--	<0.010	--
25...	1000	848	10.2	19.0	21.0	9.4	--	--	<0.010	--	<0.010	--
25...	1100	864	10.2	19.5	21.0	9.7	--	--	<0.010	--	<0.010	--

06468380 ARROWWOOD LAKE OUTFLOW SITE--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR. (UG/L) (32230)	CHLOROPHYLL A PHYTOPLANKTON, CORR. (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR. (UG/L) (32231)	CHLOROPHYLL C PHYTOPLANKTON, UNCORR. (UG/L) (32232)
APR											
30...	--	0.91	--	0.430	--	0.090	--	141	117	<0.10	22.1
MAY											
07...	--	0.82	--	0.490	--	0.080	--	124	104	<0.10	23.5
22...	0.180	--	2.7	--	0.300	--	0.110	--	--	--	--
JUN											
05...	0.310	--	1.7	--	0.150	--	0.140	8.70	2.7	4.80	7.10
19...	0.080	--	--	--	0.120	--	0.080	8.00	5.3	11.9	16.3
JUL											
03...	<0.010	--	--	--	0.370	--	0.170	8.00	6.7	6.30	5.60
17...	0.080	--	--	--	0.240	--	0.140	7.20	200	2.20	1.50
23...	0.040	--	--	--	0.280	--	0.170	4.30	5.3	2.70	1.10
24...	0.040	--	--	--	0.280	--	0.180	5.50	5.3	2.30	0.100
24...	0.040	--	--	--	0.290	--	0.190	5.90	8.0	4.80	2.20
24...	0.040	--	--	--	0.310	--	0.180	6.50	6.7	4.50	2.10
24...	0.040	--	--	--	0.280	--	0.190	6.60	6.7	2.50	1.60
24...	0.020	--	--	--	0.280	--	0.170	3.40	5.3	0.200	1.20
24...	0.040	--	--	--	0.240	--	0.190	7.70	8.0	4.00	1.90
24...	0.040	--	--	--	0.230	--	0.170	9.00	8.0	1.40	1.30
24...	0.050	--	--	--	0.210	--	0.180	19.7	16.0	3.10	1.90
24...	0.050	--	--	--	0.240	--	0.180	5.50	6.7	2.00	2.20
24...	0.030	--	--	--	0.230	--	0.210	9.40	12.0	3.30	1.00
24...	0.030	--	--	--	0.220	--	0.170	26.3	22.7	6.50	4.40
24...	0.040	--	--	--	0.240	--	0.180	3.30	5.3	1.30	0.800
24...	0.030	--	--	--	0.230	--	0.180	14.0	17.4	2.80	2.70
24...	0.040	--	--	--	0.230	--	0.180	1.60	4.0	1.00	1.40
25...	0.030	--	--	--	0.220	--	0.180	8.70	10.7	5.60	0.200
25...	0.030	--	--	--	0.240	--	0.170	3.20	2.7	2.30	0.400
25...	0.040	--	--	--	0.210	--	0.170	3.80	5.3	3.00	1.20
25...	0.040	--	--	--	0.220	--	0.210	4.30	6.7	2.70	1.10
25...	0.030	--	--	--	0.210	--	0.190	5.40	6.7	3.10	1.80
25...	0.020	--	--	--	0.210	--	0.180	3.20	5.3	2.30	0.400
25...	0.020	--	--	--	0.200	--	0.180	7.70	8.0	8.20	0.700
25...	0.030	--	--	--	0.230	--	0.180	5.00	4.0	1.50	0.200
25...	0.030	--	--	--	0.230	--	0.170	7.20	8.0	3.40	0.400

06468460 JIM LAKE NEAR PINGREE, ND

LOCATION.--Lat. 47°10'23", long 98°48'2", in NE¼SW¼ sec.28, T.143 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, near center of lake about 1 mi upstream from spillway, and about 5.5 mi east of Pingree.

INSTRUMENTATION.--Water-quality monitor since May 1989.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1989 to August 1990.

REMARKS.--Records of daily air and water temperature, specific conductance, dissolved oxygen, pH, relative humidity, solar radiation, and wind speed and direction are available in files at the District office. These daily records will be published in a separate report.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)
APR												
30...	1500	1060	8.6	0.0	4.5	14.3	--	0.020	--	0.100	--	0.330
MAY												
07...	1330	1110	8.5	22.0	17.0	9.9	--	0.010	--	0.010	--	0.330
22...	0920	1260	8.8	19.0	15.0	8.8	<0.10	--	0.020	--	0.020	--
JUN												
05...	1200	1200	8.2	18.0	15.5	9.5	--	--	<0.010	--	<0.010	--
19...	1200	1210	8.7	23.0	21.5	8.5	<0.10	--	0.010	--	0.010	--
JUL												
03...	1200	1150	9.7	29.0	27.0	10.7	--	--	--	--	<0.010	--
17...	1245	1180	9.9	23.0	21.5	11.0	--	--	<0.010	--	<0.010	--
24...	0810	1230	9.4	16.0	20.5	1.6	--	--	<0.010	--	<0.010	--
24...	1010	1230	9.6	22.5	21.0	3.8	--	--	<0.010	--	<0.010	--
24...	1210	1230	9.7	25.5	22.5	9.7	--	--	<0.010	--	<0.010	--
24...	1310	1220	9.7	26.0	23.0	12.4	--	--	<0.010	--	<0.010	--
24...	1410	1210	9.7	27.0	23.0	13.4	--	--	<0.010	--	<0.010	--
24...	1510	1250	9.7	28.0	24.0	16.5	--	--	<0.010	--	<0.010	--
24...	1610	1220	9.8	27.5	24.0	17.8	--	--	<0.010	--	<0.010	--
24...	1710	1240	9.8	27.5	24.5	--	--	--	<0.010	--	<0.010	--
24...	1810	1240	9.9	27.5	25.5	--	--	--	<0.010	--	<0.010	--
24...	1910	1220	9.9	26.5	25.5	--	--	--	<0.010	--	<0.010	--
24...	2010	1220	9.8	25.5	24.5	20.3	--	--	<0.010	--	<0.010	--
24...	2110	1220	9.9	24.0	25.0	17.9	--	--	<0.010	--	<0.010	--
24...	2210	1230	9.9	22.0	25.0	16.4	--	--	<0.010	--	<0.010	--
24...	2310	1240	9.8	20.0	24.0	14.2	--	--	<0.010	--	<0.010	--
25...	0010	1230	9.8	20.0	24.5	14.6	--	--	0.010	--	<0.010	--
25...	0210	1220	9.7	19.5	23.5	9.0	--	--	<0.010	--	<0.010	--
25...	0410	1230	9.7	19.5	23.0	7.8	--	--	<0.010	--	<0.010	--
25...	0510	1220	9.6	19.5	23.0	6.1	--	--	<0.010	--	<0.010	--
25...	0610	1200	9.6	18.0	22.5	6.6	--	--	<0.010	--	0.020	--
25...	0710	1200	9.6	18.0	22.5	6.0	--	--	<0.010	--	0.010	--
25...	0810	1190	9.6	18.5	22.5	5.3	--	--	<0.010	--	<0.010	--
25...	0910	1200	9.6	19.5	22.5	5.8	--	--	<0.010	--	<0.010	--
25...	1010	1200	9.5	19.5	22.0	5.1	--	--	<0.010	--	<0.010	--
25...	1110	--	--	--	--	--	--	--	--	--	--	--
25...	1220	1210	9.5	21.5	22.5	6.3	--	--	<0.010	--	<0.010	--

06468460 JIM LAKE NEAR PINGREE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR. (UG/L) (32230)	CHLOROPHYLL A PHYTOPLANKTON, CORR. (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR. (UG/L) (32231)	CHLOROPHYLL C PHYTOPLANKTON, UNCORR. (UG/L) (32232)
APR											
30...	--	0.86	--	0.520	--	0.180	--	94.2	37.4	4.30	15.4
MAY											
07...	--	0.80	--	0.690	--	0.290	--	92.7	58.7	7.70	26.3
22...	0.450	--	2.1	--	0.790	--	0.230	--	--	--	--
JUN											
05...	0.130	--	1.2	--	0.390	--	0.380	52.1	32.0	3.10	12.8
19...	0.100	--	1.2	--	0.450	--	0.380	48.6	66.8	17.1	25.0
JUL											
03...	--	--	0.34	--	0.340	--	0.250	77.3	66.8	15.6	21.1
17...	0.120	--	--	--	0.380	--	0.260	225	200	<0.10	18.0
24...	0.590	--	--	--	0.640	--	0.450	88.4	66.8	<0.10	2.90
24...	0.590	--	--	--	0.610	--	0.440	75.6	61.4	<0.10	6.20
24...	0.540	--	--	--	0.540	--	0.430	89.5	72.1	<0.10	7.60
24...	0.430	--	--	--	0.500	--	0.400	81.6	74.8	<0.10	7.90
24...	0.430	--	--	--	0.480	--	0.420	86.9	85.4	0.100	6.40
24...	0.410	--	--	--	0.550	--	0.420	66.7	56.1	<0.10	5.00
24...	0.310	--	--	--	0.520	--	0.440	71.8	80.1	1.80	7.70
24...	0.270	--	--	--	0.460	--	0.350	49.2	48.1	<0.10	6.50
24...	0.200	--	--	--	0.430	--	0.340	44.8	45.4	<0.10	1.40
24...	0.210	--	--	--	0.450	--	0.350	46.8	50.7	0.200	4.40
24...	0.180	--	--	--	0.430	--	0.340	41.2	37.4	0.200	<0.10
24...	0.250	--	--	--	0.460	--	0.380	24.1	18.7	0.100	0.300
24...	0.250	--	--	--	0.420	--	0.370	40.9	50.7	2.00	3.00
24...	0.210	--	--	--	0.510	--	0.390	44.4	45.4	1.00	7.20
25...	0.260	--	--	--	0.550	--	0.410	50.4	48.1	<0.10	3.90
25...	0.320	--	--	--	0.500	--	0.430	30.7	29.4	1.10	2.30
25...	0.360	--	--	--	0.530	--	0.470	25.8	37.4	4.80	4.00
25...	0.370	--	--	--	0.460	--	0.460	12.4	13.4	1.90	0.100
25...	0.340	--	--	--	0.560	--	0.470	14.5	16.0	5.00	<0.10
25...	0.300	--	--	--	0.530	--	0.420	19.2	18.7	3.80	<0.10
25...	0.330	--	--	--	0.540	--	0.450	29.2	37.4	5.80	<0.10
25...	0.320	--	--	--	0.550	--	0.460	30.4	28.5	0.600	1.60
25...	0.470	--	--	--	0.600	--	0.510	35.3	36.0	1.00	3.70
25...	--	--	--	--	--	--	--	33.2	48.1	13.7	<0.10
25...	0.500	--	--	--	0.670	--	0.530	30.4	26.7	4.80	2.60

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND

LOCATION.--Lat 46°55'50", long 98°42'23", in SE¼NW¼ sec.24, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on left bank in control house below Jamestown Dam on James River, 1.7 mi north of Jamestown Post Office, and 3.3 mi upstream from Pipestem Creek.

DRAINAGE AREA.--1,760 mi², approximately, of which about 1,010 mi² is probably noncontributing.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929; gage readings have been reduced to elevations NGVD. From June 22, 1959, to June 3, 1971, site was located 0.2 mi upstream at same datum. Prior to June 22, 1959, nonrecording gages at different locations.

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. Elevations are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 103,100 acre-ft, May 1, 1969, elevation, 1,443.60 ft; minimum since initial filling of reservoir, 18,220 acre-ft, Mar. 4, 5, 1965, elevation, 1,423.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 23,540 acre-ft, Oct. 1, elevation, 1,426.99 ft; minimum, 19,910 acre-ft, Sept. 30, elevation, 1,424.78 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,426.99	23,540	--
Oct. 31	1,426.66	22,980	-560
Nov. 30	1,426.52	22,740	-240
Dec. 31	1,426.40	22,530	-210
CAL YR 1989	--	--	-2,230
Jan. 31	1,426.35	22,450	-80
Feb. 28	1,426.25	22,280	-170
Mar. 31	1,426.40	22,530	+250
Apr. 30	1,426.24	22,260	-270
May 31	1,425.89	21,680	-580
June 30	1,426.10	22,020	+340
July 31	1,425.57	21,160	-860
Aug. 31	1,425.07	20,360	-800
Sept. 30	1,424.82	19,970	-390
WTR YR 1990	--	--	-3,570

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	RESERVOIR DEPTH (FEET) (72025)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT 24...	1102	26.4	772	704	8.4	18.0	8.5	8	94.0	11.8
JAN 04...	1110	29.5	778	790	8.3	-4.5	2.5	20	14.1	12.3
JUN 26...	0935	28.6	776	733	7.9	28.0	22.5	25	5.40	8.9
AUG 22...	1000	27.5	767	804	7.9	20.0	22.0	13	2.10	8.0

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
OCT 24...	100	240	47	29	57	34	2	3.0	253	110
JAN 04...	89	270	53	33	65	33	2	17	278	130
JUN 26...	101	240	48	29	58	33	2	14	252	120
AUG 22...	92	260	51	31	62	33	2	17	262	120

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT 24...	13	0.20	16	436	428	0.59	0.320	0.090	140
JAN 04...	15	0.20	12	509	493	0.69	0.200	0.140	140
JUN 26...	14	0.30	5.2	460	440	0.63	<0.100	0.040	140
AUG 22...	17	0.40	14	493	470	0.67	<0.100	0.070	150

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)
OCT									
24...	1102	0.0	704	8.4	8.5	11.8	5	7.0	180
24...	1104	1.60	704	8.4	8.5	11.9	--	--	--
24...	1105	3.30	704	8.4	8.5	11.8	--	--	--
24...	1106	6.60	704	8.4	8.5	11.7	--	--	--
24...	1107	13.2	704	8.4	8.5	11.7	--	--	--
24...	1109	19.8	704	8.4	8.5	11.7	--	--	--
24...	1110	26.4	704	8.4	8.5	11.5	--	--	--
JAN									
04...	1111	0.0	800	8.2	1.0	12.9	50	1.0	340
04...	1115	1.60	800	8.3	1.0	12.8	--	--	--
04...	1118	3.30	790	8.3	2.5	12.3	--	--	--
04...	1119	6.60	790	8.3	3.0	11.3	--	--	--
04...	1121	13.1	790	8.2	3.5	8.8	--	--	--
04...	1123	19.7	800	8.0	3.5	6.0	--	--	--
04...	1125	26.2	810	8.0	3.5	5.8	--	--	--
04...	1130	29.5	820	8.0	3.5	5.3	--	--	--
JUN									
26...	0928	0.0	733	7.8	23.0	9.1	5	0	0
26...	0929	1.60	733	7.9	22.5	9.0	--	--	--
26...	0930	3.30	733	7.9	22.5	8.9	--	--	--
26...	0931	6.60	732	7.9	22.0	8.8	--	--	--
26...	0932	13.1	731	7.9	21.0	8.0	--	--	--
26...	0933	19.7	731	7.9	20.0	7.5	--	--	--
26...	0934	28.6	731	7.9	20.0	6.8	--	--	--
AUG									
22...	1007	0.0	804	7.9	22.0	8.0	100	5.0	--
22...	1008	1.60	804	8.0	21.0	7.9	--	--	--
22...	1009	3.30	804	8.0	21.0	7.9	--	--	--
22...	1010	6.60	804	8.0	21.0	7.9	--	--	--
22...	1011	13.1	803	8.0	21.0	7.8	--	--	--
22...	1012	19.7	803	8.0	21.0	7.8	--	--	--
22...	1013	27.5	802	8.0	21.0	7.4	--	--	--

06469400 PIPESTEM CREEK NEAR PINGREE, ND

LOCATION.--Lat 47°10'03", long 98°58'07", in NE¼NE¼NW¼ sec.31, T.143 N., R.65 W., Stutsman County, Hydrologic Unit 10160002, on right bank on downstream side of State Highway 36 bridge, and 3 mi west of Pingree.

DRAINAGE AREA.--700 mi², of which about 440 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,500.63 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 11 to Mar. 31, Aug. 6-13, and Sept. 2-30. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--17 years, 23.5 ft³/s, 17,030 acre-ft/yr; median of yearly mean discharges, 16 ft³/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,520 ft³/s, Apr. 20, 1979, gage height, 11.60 ft, backwater from ice; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage Height (ft)	Date	Time	Discharge (ft³/s)	Gage Height (ft)
June 3	0500	*21	[a]5.55	June 20	0045	--	[a]*5.57

No flow for several months.
a - Backwater from beaver dam

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	e.80	e.46	e.00	e.00	e.00	1.0	1.1	4.6	5.8	6.5	.20
2	8.6	e.80	e.42	e.00	e.00	e.00	.67	1.2	13	5.0	6.2	e.18
3	6.5	e.80	e.38	e.00	e.00	e.00	.45	1.6	19	4.5	6.1	e.14
4	6.2	e.75	e.34	e.00	e.00	e.00	.45	1.7	13	3.5	5.2	e.10
5	6.4	e.70	e.30	e.00	e.00	e.00	.32	1.6	13	2.9	4.2	e.08
6	6.5	e.70	e.28	e.00	e.00	e.00	.22	1.7	13	2.3	e3.8	e.06
7	6.0	e.70	e.26	e.00	e.00	e.00	.14	2.2	9.9	2.0	e3.2	e.04
8	5.5	e.65	e.23	e.00	e.00	e.01	.19	1.3	9.1	1.8	e2.8	e.02
9	5.7	e.60	e.20	e.00	e.00	e.02	.22	1.1	8.6	1.3	e2.5	e.00
10	5.5	e.60	e.17	e.00	e.00	e.05	.25	.85	7.7	1.6	e2.2	e.00
11	e5.2	e.60	e.14	e.00	e.00	e.08	.24	.66	7.9	1.6	e1.9	e.00
12	e5.0	e.60	e.10	e.00	e.00	e.10	.24	.63	8.5	1.5	e1.7	e.00
13	e4.9	e.56	e.05	e.00	e.00	e.15	.28	.90	8.7	1.4	e1.4	e.00
14	e4.8	e.56	e.01	e.00	e.00	e.20	.25	1.0	9.1	1.2	.95	e.00
15	e4.6	e.56	e.00	e.00	e.00	e.25	.21	1.0	9.1	.99	.86	e.00
16	e4.4	e.56	e.00	e.00	e.00	e.28	.18	1.1	9.1	.89	.68	e.00
17	e4.0	e.56	e.00	e.00	e.00	e.30	.11	1.2	11	.90	.60	e.00
18	e3.8	e.56	e.00	e.00	e.00	e.20	.19	.77	11	1.7	.50	e.00
19	e3.5	e.56	e.00	e.00	e.00	e.15	.32	.72	15	3.8	.50	e.00
20	e3.2	e.54	e.00	e.00	e.00	e.10	.41	.71	17	6.3	.47	e.00
21	e3.0	e.54	e.00	e.00	e.00	e.10	.43	.54	9.0	8.6	.47	e.00
22	e2.7	e.54	e.00	e.00	e.00	e.20	.66	1.5	6.9	9.6	.41	e.00
23	e2.3	e.54	e.00	e.00	e.00	e.28	.79	1.5	5.8	9.8	.34	e.00
24	e2.0	e.54	e.00	e.00	e.00	e.35	1.1	2.5	5.2	8.6	.32	e.00
25	e1.7	e.54	e.00	e.00	e.00	e.25	1.5	3.3	5.8	12	.42	e.00
26	e1.4	e.52	e.00	e.00	e.00	e.20	1.2	3.5	6.7	11	.42	e.00
27	e1.0	e.52	e.00	e.00	e.00	e.28	1.1	3.3	9.6	10	.38	e.00
28	e.90	e.50	e.00	e.00	e.00	e.30	.99	3.4	11	10	.33	e.00
29	e.90	e.50	e.00	e.00	---	e.30	.96	4.2	10	9.7	.28	e.00
30	e.85	e.50	e.00	e.00	---	e.40	1.1	4.5	7.4	7.6	.25	e.00
31	e.80	---	e.00	e.00	---	e.80	---	4.5	---	6.6	.22	---
TOTAL	128.85	18.00	3.34	0.00	0.00	5.35	16.17	55.78	294.7	154.48	56.10	0.82
MEAN	4.16	.60	.11	.000	.000	.17	.54	1.80	9.82	4.98	1.81	.027
MAX	11	.80	.46	.00	.00	.80	1.5	4.5	19	12	6.5	.20
MIN	.80	.50	.00	.00	.00	.00	.11	.54	4.6	.89	.22	.00
AC-FT	256	36	6.6	.00	.00	11	32	111	585	306	111	1.6

CAL YR 1989 TOTAL 1663.37 MEAN 4.56 MAX 98 MIN .00 AC-FT 3300
WTR YR 1990 TOTAL 733.59 MEAN 2.01 MAX 19 MIN .00 AC-FT 1460

e Estimated

06469400 PIPESTEM CREEK NEAR PINGREE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
APR												
03...	1130	0.47	530	8.1	5.0	5.0	190	41	21	35	28	1
AUG												
13...	1100	1.5	1130	7.9	21.0	19.0	410	75	55	110	36	2

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
03...	7.5	180	0	147	94	12	0.10	2.2	327	301	0.44
AUG											
13...	13	510	0	417	220	15	0.20	3.8	800	743	1.09

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR											
03...	0.41	1	60	30	<1	31	190	0.6	<1	<1	240
AUG											
13...	3.18	1	170	50	<1	75	70	0.1	<1	<1	470

06470000 JAMES RIVER AT JAMESTOWN, ND

LOCATION.--Lat 46°53'22", long 98°40'58", in NW¼NE¼ sec.6, T.139 N., R.63 W., Stutsman County, Hydrologic Unit 10160003, on left bank 200 ft upstream from Interstate 94 bridge at southeast corner of Jamestown, and 3 mi downstream from Pipestem Creek.

DRAINAGE AREA.--2,820 mi², approximately, of which about 1,650 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1928 to September 1933, March to May 1935, August 1937 to September 1939, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1239: 1938(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,373.27 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1949 to Sept. 30, 1965, at former bridge 0.5 mi upstream at datum 2.00 ft higher. See WSP 1729 or 1917 for history of changes prior to Oct. 1, 1949.

REMARKS.--Estimated daily discharges: Nov. 16 to Mar. 25 and June 27 to July 10. Records good except those for periods of estimated daily discharges, which are poor. Flow regulated by Arrowwood, Jim, and Pipestem Lakes, and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 6 mi since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973.

AVERAGE DISCHARGE.--54 years (water years 1929-33, 1938-39, 1944-90), 63.8 ft³/s, 46,220 acre-ft/yr; median of yearly mean discharges, 34 ft³/s, 24,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,390 ft³/s, May 13, 1950, gage height, 15.82 ft, site and datum then in use; no flow at times in 1933 and 1989-90.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 80 ft³/s, June 19, gage height, 3.50 ft; no flow for several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.00	e9.0	e1.5	e1.5	e5.4	4.9	3.7	6.0	e6.0	1.3	.12
2	.21	.00	e8.8	e1.5	e1.6	e7.0	5.0	3.0	35	e5.0	1.1	.00
3	.28	.00	e8.0	e1.5	e1.7	e6.0	5.0	2.7	22	e4.0	1.2	.00
4	.38	.24	e7.0	e1.5	e1.8	e5.0	4.8	2.4	9.3	e3.0	1.3	.00
5	.44	.21	e6.6	e1.5	e2.0	e4.0	4.7	2.4	6.3	e2.0	1.1	2.9
6	.42	.14	e6.2	e1.5	e2.1	e3.0	4.5	2.0	3.9	e1.7	.73	.70
7	.42	1.0	e5.8	e1.7	e2.1	e2.5	4.0	1.4	2.2	e1.4	.70	4.3
8	.42	2.1	e5.4	e1.9	e2.0	e3.5	4.0	1.3	2.2	e1.2	.70	2.0
9	.57	.23	e5.0	e2.0	e1.9	e4.5	4.0	1.3	3.7	e1.0	.70	1.4
10	.77	.01	e4.6	e2.2	e1.8	e5.0	3.9	1.3	4.8	e1.2	.70	.87
11	.84	6.7	e4.3	e2.2	e1.7	e6.0	3.7	1.3	3.1	7.3	.70	.57
12	1.0	15	e4.0	e2.1	e1.6	e7.0	3.7	1.3	2.6	5.3	.70	.35
13	.63	18	e3.7	e2.0	e1.5	e5.5	3.7	1.4	2.2	4.8	.59	.14
14	.31	23	e3.4	e1.9	e1.5	e4.6	5.9	1.7	2.0	3.7	.56	.12
15	.30	26	e3.2	e1.8	e1.5	e4.3	3.9	1.6	4.6	2.6	.56	.00
16	.50	e35	e3.0	e1.7	e1.6	e3.8	3.2	1.6	3.3	2.1	.56	.00
17	.58	e28	e2.7	e1.7	e1.6	e3.7	2.9	1.4	7.8	5.4	.56	.00
18	.77	e25	e2.4	e1.7	e1.6	e3.5	2.9	1.4	5.8	2.9	1.8	8.7
19	.04	e20	e1.8	e1.6	e1.7	e3.4	2.5	1.4	28	2.7	.17	5.2
20	.00	e15	e1.5	e1.5	e1.7	e3.4	2.4	1.4	9.3	2.3	.14	2.5
21	.00	e13	e1.2	e1.5	e2.0	e3.4	2.8	1.4	9.3	1.9	.06	1.4
22	.00	e12	e1.0	e1.4	e2.4	e3.4	2.6	1.4	8.9	1.7	.05	1.1
23	.00	e11	e.90	e1.4	e3.5	e3.4	2.1	1.5	8.8	1.5	.14	.80
24	.05	e10	e1.0	e1.4	e4.5	e3.4	1.7	1.6	8.5	1.3	.26	.67
25	.02	e10	e1.1	e1.4	e6.0	e3.3	4.4	1.6	8.5	10	1.2	.56
26	.00	e9.6	e1.2	e1.6	e5.5	3.4	2.9	1.6	8.5	4.7	4.0	.56
27	.00	e9.6	e1.3	e1.8	e5.2	3.4	2.6	1.6	e20	4.4	2.0	.56
28	.00	e9.6	e1.4	e2.0	e5.0	3.4	4.7	1.7	e15	3.8	1.5	1.3
29	.00	e9.6	e1.5	e2.0	---	3.7	4.9	1.7	e12	2.9	.94	.97
30	.00	e9.9	e1.5	e1.7	---	4.2	4.4	1.8	e8.0	2.5	.50	.85
31	.00	---	e1.5	e1.6	---	4.2	---	1.6	---	1.9	.43	---
TOTAL	8.98	319.93	110.00	52.8	68.6	130.3	112.7	53.5	271.6	102.2	26.95	38.64
MEAN	.29	10.7	3.55	1.70	2.45	4.20	3.76	1.73	9.05	3.30	.87	1.29
MAX	1.0	35	9.0	2.2	6.0	7.0	5.9	3.7	35	10	4.0	8.7
MIN	.00	.00	.90	1.4	1.5	2.5	1.7	1.3	2.0	1.0	.05	.00
AC-FT	18	635	218	105	136	258	224	106	539	203	53	77

CAL YR 1989 TOTAL 2168.69 MEAN 5.94 MAX 100 MIN .00 AC-FT 4300
WTR YR 1990 TOTAL 1296.20 MEAN 3.55 MAX 35 MIN .00 AC-FT 2570

e Estimated

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1958 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
02...	1030	0.15	1140	7.6	--	1.0	4.5	2.4	9.6	73	390
NOV											
30...	1030	9.9	970	7.3	--	-5.0	0.5	1.1	12.0	82	330
JAN											
08...	1600	1.9	1280	7.6	--	2.0	0.5	3.5	7.6	53	410
FEB											
20...	1100	1.7	1250	7.6	--	0.0	0.0	35	10.6	72	430
MAR											
27...	1200	3.5	910	--	7.8	5.0	4.5	3.4	15.5	117	320
MAY											
22...	1600	1.5	1050	7.4	--	26.0	21.5	6.6	15.4	173	350
JUL											
10...	0900	0.98	1080	--	8.1	23.0	18.5	3.5	2.5	26	360
AUG											
14...	0900	0.62	1380	7.2	--	20.5	18.0	3.3	5.6	58	450

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)
OCT											
02...	100	35	100	35	2	8.2	396	210	24	662	716
NOV											
30...	73	37	77	32	2	14	277	210	24	645	603
JAN											
08...	100	38	120	38	3	9.4	450	190	44	810	774
FEB											
20...	110	38	120	37	3	9.4	412	220	51	834	798
MAR											
27...	79	29	78	34	2	6.9	276	180	34	606	573
MAY											
22...	86	34	93	36	2	9.2	310	210	40	698	660
JUL											
10...	88	35	96	36	2	9.0	328	200	48	698	675
AUG											
14...	110	43	130	38	3	11	397	270	58	878	863

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT											
02...	0.90	0.27	4	--	--	<0.010	--	<0.100	--	0.020	--
NOV											
30...	0.88	17.2	6	0.210	--	0.020	--	0.230	--	0.250	--
JAN											
08...	1.10	4.11	6	--	--	<0.010	--	0.100	--	0.650	--
FEB											
20...	1.13	3.87	9	--	--	<0.010	--	0.100	--	0.360	--
MAR											
27...	0.82	5.69	3	--	<0.010	<0.010	<0.100	<0.100	0.100	0.100	0.80
MAY											
22...	0.95	2.75	16	--	<0.010	<0.010	<0.100	<0.100	0.030	0.120	1.1
JUL											
10...	0.95	1.85	8	--	--	0.020	--	<0.100	--	0.230	--
AUG											
14...	1.19	1.47	8	--	<0.010	<0.010	<0.100	0.200	0.090	0.100	0.70

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)
OCT 02...	1.1	--	<0.010	--	0.003	--	5	470	--	<1.0
NOV 30...	1.2	--	0.040	--	0.028	--	2	230	--	<1.0
JAN 08...	1.1	--	0.040	--	0.032	--	2	450	--	<1.0
FEB 20...	0.90	--	<0.010	--	0.001	--	2	440	--	2.0
MAR 27...	0.40	0.100	0.020	0.062	0.016	2	1	300	2	2.0
MAY 22...	0.40	0.170	0.020	0.062	0.018	3	2	430	<1	<10
JUL 10...	0.90	--	0.070	--	0.039	--	4	460	--	<10
AUG 14...	0.40	0.070	0.030	0.044	0.004	4	3	630	<1	<10

DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
OCT 02...	<1	--	14	1	--	1000	<3.1	--	<1	9
NOV 30...	<1	--	42	<1	--	230	0.1	--	<1	<3
JAN 08...	<10	--	89	10	--	1200	0.2	--	<1	6
FEB 20...	<10	--	120	10	--	760	0.3	--	<1	4
MAR 27...	<10	610	24	<10	820	570	0.2	<1	<1	<3
MAY 22...	1	1100	13	<1	890	780	0.3	<1	<1	<3
JUL 10...	<1	--	20	<1	--	1100	0.2	--	<1	<3
AUG 14...	3	590	28	<1	620	850	0.2	<1	<1	11

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	PLANKTON BIOMASS ASH WT (MG/L) (81353)	PLANKTON BIOMASS DRY WT (MG/L) (81354)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 02...	--	--	<0.01	--	--	--	--	15	0.01	75
NOV 30...	--	--	<0.01	--	--	--	--	51	1.4	25
JAN 08...	--	--	0.04	--	--	--	--	139	0.71	9
FEB 20...	--	--	<0.01	--	--	--	--	125	0.58	4
MAR 27...	5.8	<0.010	<0.01	3.70	0.500	18	1100	61	0.57	58
MAY 22...	7.5	<0.010	<0.01	6.00	<0.200	14	1100	122	0.48	29
JUL 10...	--	--	<0.01	--	--	--	--	52	0.14	58
AUG 14...	5.2	<0.010	<0.01	4.60	<0.600	18	1300	56	0.09	50

06470500 JAMES RIVER AT LA MOURE, ND

LOCATION.--Lat 46°21'20", long 98°18'15", in NE¼NE¼ sec.11, T.133 N., R.61 W., LaMoure County, Hydrologic Unit 10160003, on left bank 80 ft downstream from bridge on State Highway 13, 0.5 mi west of LaMoure, and 12 mi upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 mi², approximately, of which about 2,600 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to July 1903 (gage-height record only), April 1950 to current year. Gage-height records for 1902-11 are contained in reports of the National Oceanic and Atmospheric Administration.

REVISED RECORDS.--WSP 1917: Drainage area.

GAGE.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Apr. 19, 1950.

REMARKS.--Records good. Flow regulated by Arrowwood, Jim, and Pipestem Lakes and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 85 mi upstream since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973.

AVERAGE DISCHARGE.--40 years (water years 1951-90), 97.9 ft³/s, 70,930 acre-ft/yr; median of yearly mean discharges, 70 ft³/s, 50,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,800 ft³/s, Apr. 14, 1969, gage height, 16.17 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 89 ft³/s, Apr. 3, gage height, 7.10 ft; no flow for several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	9.4	18	3.5	7.9	6.9	46	19	12	16	4.1	.28
2	2.4	6.8	17	3.6	6.9	7.6	25	20	49	17	12	.08
3	.00	6.2	14	3.6	6.2	7.0	38	18	23	24	11	.81
4	.33	11	15	3.7	6.1	7.0	39	25	6.2	16	8.1	3.2
5	11	14	15	3.7	6.2	7.5	33	18	35	11	4.1	1.2
6	5.0	6.4	15	3.6	5.9	7.8	18	14	38	4.8	3.6	2.9
7	3.6	9.1	15	3.5	6.0	8.0	22	27	39	15	2.7	5.0
8	4.1	21	13	3.8	5.5	7.8	14	15	51	16	3.2	1.6
9	18	16	13	4.6	6.1	8.5	29	22	32	7.6	5.3	2.4
10	.13	1.4	12	5.3	6.0	9.7	21	9.6	21	9.8	4.9	1.4
11	5.8	11	11	6.6	6.0	11	17	13	29	17	.87	1.6
12	2.7	2.8	9.1	5.1	6.0	15	14	12	32	12	2.4	1.9
13	4.9	14	8.1	5.1	6.8	16	16	12	25	8.8	.36	7.5
14	5.4	7.5	7.0	5.0	6.4	16	14	19	18	10	2.1	.00
15	17	12	6.0	5.1	6.0	16	5.3	9.9	18	14	.00	2.2
16	1.7	13	5.0	5.3	6.5	16	21	35	21	7.4	.00	.00
17	3.9	12	4.2	6.0	5.8	15	7.2	23	23	19	.35	.00
18	3.7	18	3.9	6.0	5.4	16	5.2	1.2	18	12	2.7	3.3
19	4.2	27	3.4	6.0	4.9	17	19	9.3	33	13	.83	1.9
20	7.8	35	2.8	6.0	4.6	18	17	14	29	13	.50	4.2
21	6.2	40	2.1	6.1	4.8	20	12	13	23	13	.48	6.4
22	9.3	41	1.0	5.9	5.2	21	9.0	21	27	11	1.3	9.2
23	8.9	39	.42	6.1	6.1	22	13	14	24	8.6	4.2	.00
24	6.0	34	.89	7.0	7.7	20	15	10	26	8.6	4.6	2.2
25	6.5	30	2.1	7.0	7.4	20	16	11	25	13	3.8	2.6
26	1.7	29	2.4	7.1	6.5	20	23	16	20	16	13	1.4
27	11	30	2.6	7.7	5.9	22	29	12	21	21	7.1	1.7
28	13	22	3.6	7.4	5.7	22	19	12	27	20	3.3	2.2
29	15	18	3.5	7.9	---	23	18	7.8	23	14	2.4	4.5
30	5.0	18	3.5	8.6	---	24	26	7.4	20	9.3	.67	5.0
31	7.9	---	3.6	8.2	---	29	---	4.7	---	6.0	2.9	---
TOTAL	214.16	554.6	233.21	174.1	170.5	476.8	600.7	464.9	788.2	403.9	112.86	76.67
MEAN	6.91	18.5	7.52	5.62	6.09	15.4	20.0	15.0	26.3	13.0	3.64	2.56
MAX	22	41	18	8.6	7.9	29	46	35	51	24	13	9.2
MIN	.00	1.4	.42	3.5	4.6	6.9	5.2	1.2	6.2	4.8	.00	.00
AC-FT	425	1100	463	345	338	946	1190	922	1560	801	224	152

CAL YR 1989 TOTAL 14302.08 MEAN 39.2 MAX 880 MIN .00 AC-FT 28370
WTR YR 1990 TOTAL 4270.60 MEAN 11.7 MAX 51 MIN .00 AC-FT 8470

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1957 to current year.

PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE: October 1976 to current year.
WATER TEMPERATURE: June 1953 to September 1975, October 1976 to current year.

INSTRUMENTATION.--Temperature recorder from June 1953 to September 1978. Water-quality monitor since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 2,160 microsiemens, Jan. 9, 1990; minimum, 183 microsiemens, Mar. 30, 1989.
WATER TEMPERATURE: Maximum, 33.0 °C, July 12, 13, 1957; July 23, 1977; minimum, 0.0 °C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 2,160 microsiemens, Jan. 9; minimum, 470 microsiemens, Mar. 31.
WATER TEMPERATURE: Maximum, 30.1 °C, June 26; minimum, 0.0 °C on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
02...	1300	1.3	930	8.2	3.0	8.0	20	17	10.4	85	290
NOV											
28...	1100	21	1300	8.0	-18.0	0.0	25	2.7	15.8	105	430
JAN											
09...	1000	4.9	2160	7.6	-4.0	0.0	35	4.3	9.6	65	680
FEB											
20...	1430	4.8	1650	7.9	4.0	0.0	8	1.0	>20.0	--	540
MAR											
27...	1330	23	710	9.5	8.0	1.0	13	1.0	8.5	59	220
MAY											
15...	1030	5.0	960	7.9	15.0	13.5	25	34	9.5	90	320
JUL											
11...	1830	16	1040	8.2	25.0	23.5	25	2.5	7.0	80	320
AUG											
14...	1100	4.4	1120	8.2	23.0	19.5	14	24	9.2	98	330

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT											
02...	66	31	87	38	2	12	264	160	48	0.30	556
NOV											
28...	96	47	120	37	3	12	379	260	60	0.30	845
JAN											
09...	160	67	250	44	4	21	583	450	120	0.70	1490
FEB											
20...	130	52	160	38	3	14	499	270	89	0.30	1100
MAR											
27...	52	23	67	38	2	7.7	202	130	33	<0.10	435
MAY											
15...	75	33	90	37	2	9.4	305	170	49	0.20	611
JUL											
11...	71	35	96	38	2	10	308	180	52	0.30	673
AUG											
14...	70	37	130	45	3	12	347	180	68	0.30	684

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
OCT 02...	563	0.76	1.89	39	--	--	<0.010	--	<0.100	--	0.020
NOV 28...	823	1.15	47.7	8	--	--	0.010	--	<0.100	--	0.030
JAN 09...	1420	2.03	19.8	6	0.520	--	0.040	--	0.560	--	0.600
FEB 20...	1020	1.50	14.3	33	--	--	0.030	--	<0.100	--	0.030
MAR 27...	434	0.59	27.0	<1	--	<0.010	<0.010	<0.100	<0.100	0.020	0.020
MAY 15...	611	0.83	8.17	73	--	0.050	0.010	<0.100	<0.100	0.060	0.060
JUL 11...	630	0.92	28.9	44	--	--	<0.010	--	<0.100	--	0.080
AUG 14...	707	0.93	8.11	54	--	0.020	<0.010	<0.100	<0.100	0.060	0.010

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)
OCT 02...	--	0.50	--	0.030	--	0.037	--	2	340	--	<1.0
NOV 28...	--	0.50	--	0.070	--	0.061	--	1	380	--	<1.0
JAN 09...	--	1.9	--	0.250	--	0.245	--	2	780	--	<10
FEB 20...	--	0.40	--	<0.010	--	0.005	--	<1	540	--	<1.0
MAR 27...	0.60	0.40	0.090	0.030	0.042	0.024	1	1	210	<1	<1.0
MAY 15...	1.5	0.50	0.320	0.020	0.058	0.011	1	1	320	<1	<10
JUL 11...	--	1.1	--	0.130	--	0.083	--	5	370	--	<10
AUG 14...	2.0	0.90	0.300	0.140	0.164	0.086	8	8	480	<1	<10

DATE	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
OCT 02...	1	--	11	<1	--	300	0.4	--	<1	18
NOV 28...	1	--	<3	<1	--	74	0.6	--	<1	8
JAN 09...	2	--	30	<1	--	770	0.2	--	<1	10
FEB 20...	<10	--	9	<10	--	55	0.2	--	<1	<3
MAR 27...	<10	170	17	<10	40	20	0.2	<1	<1	<3
MAY 15...	1	2400	13	1	1700	950	0.2	<1	<1	<3
JUL 11...	1	--	3	1	--	450	0.1	--	<1	4
AUG 14...	1	1400	6	<1	840	610	0.2	<1	<1	13

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) 70954)	PLANK-TON BIOMASS ASH WT (MG/L) (81353)	PLANK-TON BIOMASS DRY WT (MG/L) (81354)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
02...	--	--	<0.01	--	--	--	--	42	0.14	98
NOV										
28...	--	--	<0.01	--	--	--	--	63	3.6	8
JAN										
09...	--	--	<0.01	--	--	--	--	250	3.3	6
FEB										
20...	--	--	<0.01	--	--	--	--	69	0.90	26
MAR										
27...	6.2	<0.010	<0.01	4.80	<0.500	7.1	1200	4	0.25	66
MAY										
15...	12	<0.010	<0.01	22.0	1.70	33	1200	148	2.0	74
JUL										
11...	--	--	<0.01	--	--	--	--	65	2.8	92
AUG										
14...	16	<0.010	<0.01	20.0	3.40	24	1300	54	0.64	98

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	980	900	943	1030	968	1010	1410	1300	1370	---	---	---
2	950	880	906	1060	989	1020	1440	1280	1360	---	---	---
3	942	872	913	1050	980	1020	1370	1260	1300	---	---	---
4	954	932	942	1060	993	1030	1460	1360	1400	---	---	---
5	945	904	923	1040	994	1020	1450	1360	1420	---	---	---
6	956	926	938	1050	976	1010	1490	1330	1420	---	---	---
7	949	928	941	1070	986	1020	1540	1420	1490	---	---	---
8	969	919	950	1050	1020	1030	1570	1400	1500	---	---	---
9	971	901	940	1070	990	1040	1580	1490	1550	---	---	---
10	963	863	943	1110	1010	1060	1600	1510	1570	---	---	---
11	954	884	920	1050	963	1030	1610	1520	1590	---	---	---
12	976	895	933	1060	965	1020	1650	1590	1610	---	---	---
13	988	927	954	1080	976	1020	1650	1580	1620	---	---	---
14	979	958	968	1090	1020	1040	1710	1560	1660	---	---	---
15	981	941	966	1050	959	1010	1740	1630	1690	---	---	---
16	983	942	960	1120	1030	1090	1790	1700	1760	---	---	---
17	994	944	979	1120	1020	1070	1840	1760	1800	---	---	---
18	1010	946	978	1170	1070	1120	1900	1820	1860	---	---	---
19	1010	937	980	1170	1070	1110	1960	1830	1910	---	---	---
20	1020	948	995	1150	1040	1120	2030	1960	2000	---	---	---
21	1010	970	995	1110	1020	1050	---	---	---	---	---	---
22	1000	952	981	1100	980	1070	---	---	---	---	---	---
23	1000	953	981	1210	1090	1160	---	---	---	---	---	---
24	995	905	960	1230	1120	1170	---	---	---	---	---	---
25	1010	937	968	1230	1120	1160	---	---	---	---	---	---
26	1020	919	986	1340	1210	1290	---	---	---	---	---	---
27	1000	919	961	1340	1250	1300	---	---	---	---	---	---
28	1000	921	965	1420	1270	1340	---	---	---	---	---	---
29	993	932	973	1420	1260	1360	---	---	---	---	---	---
30	1020	905	970	1410	1320	1390	---	---	---	---	---	---
31	1030	955	992	---	---	---	---	---	---	---	---	---
MONTH	1030	863	958	1420	959	1110	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	580	540	557	840	760	830
2	---	---	---	---	---	---	590	560	576	858	768	829
3	---	---	---	---	---	---	590	570	585	856	797	836
4	---	---	---	---	---	---	640	590	611	865	826	845
5	---	---	---	---	---	---	670	630	648	883	844	857
6	---	---	---	---	---	---	690	630	667	902	812	872
7	---	---	---	---	---	---	670	610	646	911	871	896
8	---	---	---	---	---	---	670	600	640	939	890	912
9	---	---	---	---	---	---	680	630	646	968	909	925
10	---	---	---	---	---	---	680	630	659	946	887	928
11	---	---	---	---	---	---	690	620	659	945	925	936
12	---	---	---	---	---	---	700	640	671	954	925	938
13	---	---	---	---	---	---	700	630	671	962	863	934
14	---	---	---	---	---	---	720	630	674	971	941	952
15	---	---	---	---	---	---	740	650	693	980	941	965
16	---	---	---	---	---	---	730	660	700	990	970	979
17	---	---	---	---	---	---	739	658	714	999	979	988
18	---	---	---	---	---	---	737	677	710	1010	989	1000
19	---	---	---	---	---	---	766	676	730	1020	999	1010
20	---	---	---	---	---	---	774	695	737	1020	998	1000
21	---	---	---	---	---	---	793	713	761	1020	998	1010
22	---	---	---	---	---	---	811	722	776	1040	1010	1020
23	---	---	---	---	---	---	831	781	809	1060	967	1030
24	---	---	---	---	---	---	839	758	821	1070	977	1030
25	---	---	---	---	---	---	867	787	843	1070	1010	1050
26	---	---	---	---	---	---	857	817	842	1070	1050	1060
27	---	---	---	---	---	---	865	804	845	1080	1030	1050
28	---	---	---	---	---	---	854	764	823	1080	1040	1060
29	---	---	---	---	---	---	853	831	841	1100	1050	1080
30	---	---	---	---	---	---	841	750	830	1110	1070	1090
31	---	---	---	610	470	555	---	---	---	1110	1080	1100
MONTH	---	---	---	---	---	---	867	540	713	1110	760	968

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1130	1070	1100	1060	1010	1040	1110	1080	1090	1170	1120	1140
2	1090	1050	1070	1040	1010	1030	1120	1080	1110	1160	1120	1140
3	1080	1040	1060	1030	993	1010	1120	1080	1100	1170	1140	1160
4	1070	1050	1060	1000	972	988	1100	1070	1080	1170	1130	1150
5	1080	1010	1050	1010	972	982	1120	1070	1090	1170	1130	1150
6	1060	1020	1040	1000	962	987	1110	1070	1090	1160	1130	1150
7	1030	1000	1020	1020	992	1010	1120	1080	1090	1130	1100	1120
8	1030	1000	1010	1030	991	1010	1130	1080	1100	1140	1100	1120
9	1070	1020	1040	1070	1000	1040	1120	1090	1100	1140	1090	1120
10	1070	1030	1050	1080	1030	1050	1110	1080	1100	1120	1080	1110
11	1060	1040	1050	1050	1030	1040	1110	1080	1100	1130	1080	1110
12	1050	1010	1030	1090	1040	1060	1110	1090	1100	1130	1100	1110
13	1030	1000	1020	1120	1060	1080	1150	1110	1120	1140	1090	1110
14	1020	989	1000	1130	1050	1100	1150	1110	1130	1130	1100	1110
15	1010	989	997	1140	1100	1120	1150	1110	1130	1140	1110	1120
16	999	989	998	1170	1110	1140	1160	1120	1140	1150	1130	1140
17	1020	989	1000	1180	1130	1160	1160	1130	1150	1140	1130	1140
18	1050	1010	1030	1180	1140	1160	1140	1090	1120	1150	1120	1140
19	1070	998	1030	1180	1140	1160	1110	1100	1100	1140	1130	1140
20	1080	1030	1050	1150	1140	1140	1130	1100	1110	1140	1130	1140
21	1100	1060	1070	1140	1130	1140	1140	1110	1120	1150	1130	1140
22	1120	1080	1100	1150	1120	1130	1160	1110	1130	1170	1140	1150
23	1160	1110	1120	1160	1120	1130	1170	1120	1150	1180	1170	1170
24	1150	1100	1120	1150	1110	1130	1160	1110	1140	1200	1170	1180
25	1160	1110	1130	1140	1100	1120	1150	1100	1120	1210	1180	1190
26	1150	1090	1130	1130	1080	1110	1090	1050	1070	1220	1190	1200
27	1130	1090	1110	1120	1090	1110	1110	1060	1090	1220	1200	1210
28	1140	1080	1110	1120	1080	1110	1110	1070	1090	1220	1210	1220
29	1120	1080	1100	1120	1080	1100	1130	1080	1110	1230	1220	1220
30	1100	1050	1080	1120	1090	1090	1140	1090	1120	1230	1220	1220
31	---	---	---	1120	1080	1100	1150	1100	1130	---	---	---
MONTH	1160	989	1060	1180	962	1080	1170	1050	1110	1230	1080	1150

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.9	10.9	14.4	4.0	2.1	2.9	.2	.0	.1	.0	.0	.0
2	10.7	7.9	8.8	2.1	1.2	1.7	.0	.0	.0	.0	.0	.0
3	10.5	6.7	8.4	1.2	.1	.4	.0	.0	.0	.0	.0	.0
4	8.0	6.7	7.3	1.8	.3	.9	.3	.0	.1	.0	.0	.0
5	8.9	6.3	7.4	2.0	1.6	1.9	.7	.2	.5	.0	.0	.0
6	8.5	6.4	7.6	3.2	1.7	2.3	.6	.2	.4	.0	.0	.0
7	8.7	6.4	7.5	3.3	2.2	2.9	.2	.0	.0	.0	.0	.0
8	8.0	6.7	7.5	3.2	2.0	2.6	.0	.0	.0	.0	.0	.0
9	9.2	7.1	8.1	2.7	1.3	2.2	.0	.0	.0	.0	.0	.0
10	9.8	7.6	8.7	2.6	1.4	1.9	.0	.0	.0	.0	.0	.0
11	9.6	8.6	9.1	2.9	2.1	2.6	.0	.0	.0	.0	.0	.0
12	10.5	7.8	8.9	2.5	1.8	2.2	.0	.0	.0	.0	.0	.0
13	11.3	8.8	9.8	2.1	.7	1.4	.0	.0	.0	.0	.0	.0
14	11.3	9.3	10.3	1.5	.7	1.1	.0	.0	.0	.0	.0	.0
15	10.4	7.5	9.0	1.7	.0	.8	.0	.0	.0	.0	.0	.0
16	7.9	6.4	7.1	.4	.0	.1	.0	.0	.0	.0	.0	.0
17	7.0	5.0	6.1	2.1	.5	1.5	.0	.0	.0	.0	.0	.0
18	5.8	3.8	5.0	2.1	1.5	1.8	.0	.0	.0	.0	.0	.0
19	5.2	3.9	4.7	2.3	1.5	1.9	.0	.0	.0	.0	.0	.0
20	6.6	3.8	4.9	2.6	2.0	2.4	.0	.0	.0	.0	.0	.0
21	6.6	4.6	5.6	2.6	2.0	2.4	.0	.0	.0	.0	.0	.0
22	8.5	5.7	6.5	1.7	.4	1.0	.0	.0	.0	.0	.0	.0
23	8.9	6.0	7.3	.4	.0	.2	.0	.0	.0	.0	.0	.0
24	9.6	7.2	8.5	.6	.0	.2	.0	.0	.0	.0	.0	.0
25	11.4	8.5	9.8	1.0	.5	.7	.0	.0	.0	.0	.0	.0
26	13.6	11.4	12.6	.8	.4	.6	.0	.0	.0	.0	.0	.0
27	13.1	10.5	11.6	.6	.3	.5	.0	.0	.0	.0	.0	.0
28	10.3	9.1	9.7	.5	.0	.2	.0	.0	.0	.0	.0	.0
29	9.3	6.5	7.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	6.3	4.6	5.6	.1	.0	.1	.0	.0	.0	.0	.0	.0
31	5.3	4.2	4.7	---	---	---	.0	.0	.0	.0	.0	.0
MONTH	15.9	3.8	8.1	4.0	.0	1.4	.7	.0	.0	.0	.0	.0

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.0	.0	.0	1.7	.0	.8	9.4	4.2	6.5
2	.0	.0	.0	.0	.0	.0	3.5	.3	1.9	13.1	6.5	9.4
3	.0	.0	.0	.0	.0	.0	5.3	1.9	3.6	12.3	10.1	11.4
4	.0	.0	.0	.0	.0	.0	6.1	3.3	4.8	14.3	10.2	12.2
5	.0	.0	.0	.0	.0	.0	4.5	1.3	2.9	14.2	11.9	13.2
6	.0	.0	.0	.0	.0	.0	4.7	1.1	3.1	15.7	12.0	13.9
7	.0	.0	.0	.0	.0	.0	6.7	2.9	4.7	17.6	14.6	15.8
8	.0	.0	.0	.0	.0	.0	6.7	4.6	5.6	16.2	13.7	15.0
9	.0	.0	.0	.0	.0	.0	6.2	4.9	5.7	14.6	9.2	11.4
10	.0	.0	.0	.0	.0	.0	5.2	3.0	4.5	11.6	7.9	9.7
11	.0	.0	.0	.0	.0	.0	4.6	1.8	3.2	14.3	9.8	11.8
12	.0	.0	.0	.0	.0	.0	7.7	2.5	4.9	17.5	11.2	13.4
13	.0	.0	.0	.0	.0	.0	8.6	5.1	6.8	15.2	12.9	14.1
14	.0	.0	.0	.0	.0	.0	8.2	6.3	7.1	15.0	12.5	13.8
15	.0	.0	.0	.0	.0	.0	8.2	5.1	6.7	13.8	13.0	13.4
16	.0	.0	.0	.0	.0	.0	7.4	5.8	6.6	12.9	10.6	12.1
17	.0	.0	.0	.0	.0	.0	8.2	4.3	6.3	12.4	8.3	10.4
18	.0	.0	.0	.0	.0	.0	8.8	6.0	7.4	11.3	9.4	10.3
19	.0	.0	.0	.0	.0	.0	12.6	6.8	9.1	9.5	8.8	9.2
20	.0	.0	.0	.0	.0	.0	16.2	8.7	12.0	12.5	8.9	10.7
21	.0	.0	.0	.0	.0	.0	15.5	11.8	13.5	14.0	12.0	12.8
22	.0	.0	.0	.0	.0	.0	17.5	13.4	15.5	16.7	12.9	14.6
23	.0	.0	.0	.1	.0	.0	19.0	16.3	17.7	19.0	14.9	16.7
24	.0	.0	.0	.2	.0	.0	18.6	16.9	18.0	19.0	17.1	18.0
25	.0	.0	.0	.3	.0	.1	19.3	16.7	18.0	17.6	15.8	16.6
26	.0	.0	.0	.3	.0	.0	18.2	14.4	16.6	19.4	15.1	17.0
27	.0	.0	.0	.3	.0	.0	14.1	5.4	9.8	23.0	16.9	19.5
28	.0	.0	.0	.0	.0	.0	6.6	3.1	5.1	21.0	18.2	19.7
29	---	---	---	.5	.0	.1	8.2	4.9	6.6	21.6	17.5	19.3
30	---	---	---	.7	.0	.2	6.9	5.4	6.1	19.8	17.7	19.0
31	---	---	---	.7	.0	.2	---	---	---	19.1	17.5	18.6
MONTH	.0	.0	.0	.7	.0	.0	19.3	.0	7.8	23.0	4.2	13.9

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.7	17.2	18.8	26.0	23.1	25.0	24.1	21.0	22.5	26.6	21.5	24.0
2	19.8	13.2	17.5	27.9	24.6	26.1	26.3	21.7	23.7	24.3	22.0	23.4
3	13.5	9.6	11.7	28.4	26.1	27.2	24.7	22.9	23.7	24.1	22.6	23.3
4	15.8	12.1	13.9	26.5	24.7	25.6	22.8	20.5	21.6	23.2	21.7	22.6
5	18.0	14.7	16.2	25.8	22.4	24.1	25.2	19.7	22.4	24.3	21.0	22.5
6	19.8	15.5	17.4	24.0	21.9	23.1	23.4	21.0	22.2	25.1	22.3	23.6
7	18.4	16.9	17.5	25.1	22.3	23.5	23.0	20.4	21.8	25.8	20.8	23.3
8	18.1	15.6	16.9	24.6	22.3	23.6	23.5	20.5	22.0	25.2	20.7	22.7
9	21.8	16.3	18.9	28.5	22.4	25.1	22.4	21.3	21.7	24.0	20.2	22.0
10	22.5	19.6	21.1	26.1	23.8	25.0	21.9	20.1	21.0	22.4	20.2	21.2
11	23.8	20.3	21.8	23.5	22.0	22.7	21.0	18.8	19.8	22.2	19.5	20.8
12	25.4	20.9	22.8	23.5	20.0	21.8	19.5	17.6	18.6	23.2	19.6	21.2
13	24.3	21.2	22.6	23.5	20.9	22.3	20.2	17.6	18.9	21.2	19.1	20.2
14	22.3	19.3	20.5	24.4	21.0	22.6	22.3	18.6	20.3	20.7	17.0	18.8
15	19.1	16.6	17.5	23.7	21.8	22.8	22.2	20.1	21.2	18.8	17.0	17.9
16	19.0	16.2	17.4	24.3	21.5	23.0	23.4	20.0	21.7	18.2	15.2	16.4
17	20.2	17.8	18.8	24.8	22.1	23.4	26.6	22.2	23.9	15.5	14.3	15.0
18	23.2	18.8	20.8	24.7	22.5	23.6	24.0	22.2	23.0	15.8	14.6	15.1
19	26.0	20.8	23.0	25.5	21.6	23.3	22.0	20.6	21.2	18.0	14.0	15.4
20	22.9	20.6	21.9	24.1	21.6	22.5	21.5	19.7	20.3	15.3	14.5	14.9
21	22.4	20.0	21.2	21.6	20.0	20.9	20.9	19.2	19.9	14.9	13.1	14.1
22	21.8	19.7	20.9	22.1	19.0	20.5	22.6	19.5	20.9	13.7	10.4	11.6
23	25.8	19.3	21.9	21.9	19.8	20.8	24.9	21.6	23.0	11.5	9.4	10.5
24	25.1	20.8	22.8	23.7	19.9	21.7	25.9	22.6	24.0	14.3	10.1	11.9
25	27.8	23.1	25.0	23.2	21.4	22.5	25.4	22.2	23.7	16.2	12.9	14.5
26	30.1	23.9	26.5	24.9	22.2	23.5	24.8	22.0	23.5	17.0	14.6	15.7
27	26.8	22.5	23.7	25.4	23.1	24.0	27.1	23.2	25.0	16.0	14.4	15.2
28	27.9	21.8	24.2	25.9	22.9	24.4	25.0	23.6	24.3	16.1	13.5	14.4
29	25.9	22.9	24.0	24.7	22.7	23.8	24.9	21.8	23.4	13.7	12.1	12.9
30	27.6	23.0	25.1	24.1	21.4	22.8	24.0	22.0	23.0	13.3	11.1	12.2
31	---	---	---	23.6	21.2	22.5	24.3	21.8	23.0	---	---	---
MONTH	30.1	9.6	20.4	28.5	19.0	23.3	27.1	17.6	22.1	26.6	9.4	17.9

06470800 BEAR CREEK NEAR OAKES, ND

LOCATION.--Lat 46°13'31", long 98°04'17", in NE¼NE¼ sec.28, T.132 N., R.59 W., Dickey County, Hydrologic Unit 10160003, on right bank 80 ft downstream from bridge on ND Highway 13, 6 mi north, and 1 mi east of Oakes.

DRAINAGE AREA.--357 mi², of which about 255 mi² is noncontributing, revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,291.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 15 to Mar. 13, Aug. 14-23, and Sept. 18-30. Records fair.

AVERAGE DISCHARGE.--14 years, 8.19 ft³/s, 5,930 acre-ft/yr; median of yearly mean discharges, 5.4 ft³/s, 3,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft³/s, Apr. 15, 1979, gage height, 11.47 ft; no flow for long periods each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1, 1975, reached a stage of 15.00 ft present datum, from floodmark, discharge 4,590 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
July 1	1645	*18	*6.40				

No flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.12	e.10	e.00	e.00	e.01	.58	5.0	.07	16	.97	.15
2	.10	.12	e.10	e.00	e.00	e.02	.50	4.7	.27	17	.88	.14
3	.09	.11	e.11	e.00	e.00	e.02	.53	3.4	.60	16	.82	.12
4	.29	.12	e.11	e.00	e.00	e.03	.54	1.2	.66	14	.73	.11
5	.39	.14	e.10	e.00	e.00	e.03	.54	1.1	.73	12	.62	.10
6	.40	.12	e.09	e.00	e.00	e.04	.37	1.1	.50	9.9	.53	.10
7	.40	.12	e.09	e.00	e.00	e.05	.35	1.1	.31	8.8	.49	.12
8	.17	.15	e.08	e.00	e.00	e.06	.29	1.0	.29	7.8	.41	.12
9	.11	.14	e.06	e.00	e.00	e.07	.30	1.0	.23	7.0	.34	.12
10	.06	.11	e.05	e.00	e.00	e.08	.29	1.1	.17	6.6	.29	.10
11	.08	.12	e.04	e.00	e.00	e.09	.26	.92	.13	7.2	.26	.09
12	.08	.09	e.03	e.00	e.00	e.10	.24	.99	.13	7.2	.25	.08
13	.08	.11	e.02	e.00	e.00	e.20	.22	.96	.10	6.9	.20	.09
14	.08	.10	e.01	e.00	e.00	.27	.23	.80	.08	6.1	e.19	.07
15	.10	e.10	e.00	e.00	e.00	.41	.21	.74	.07	5.2	e.17	.06
16	.08	e.10	e.00	e.00	e.00	.65	.22	.86	.08	4.3	e.15	.04
17	.07	e.10	e.00	e.00	e.00	.72	.19	.88	.09	4.0	e.13	.04
18	.08	e.09	e.00	e.00	e.00	.78	.17	.63	.09	3.3	e.12	e.03
19	.06	e.09	e.00	e.00	e.00	.76	.19	.61	.13	2.8	e.10	e.02
20	.23	e.09	e.00	e.00	e.00	.75	.22	.51	.12	2.4	e.09	e.01
21	.09	e.10	e.00	e.00	e.00	.82	.23	.29	.07	2.1	e.08	e.00
22	.09	e.11	e.00	e.00	e.00	.82	.22	.24	.05	1.8	e.08	e.00
23	.10	e.11	e.00	e.00	e.00	.89	.25	.23	.05	1.7	e.07	e.00
24	.09	e.11	e.00	e.00	e.00	.55	.34	.20	.05	1.6	.07	e.00
25	.09	e.10	e.00	e.00	e.00	.42	.70	.16	.06	1.5	.07	e.00
26	.07	e.10	e.00	e.00	e.00	.29	1.3	.16	.06	1.5	.14	e.00
27	.07	e.10	e.00	e.00	e.00	.28	1.9	.14	.05	1.5	.17	e.00
28	.10	e.10	e.00	e.00	e.00	.32	2.0	.14	.06	1.3	.19	e.00
29	.11	e.10	e.00	e.00	---	.37	2.2	.12	1.1	1.3	.19	e.00
30	.11	e.10	e.00	e.00	---	.37	2.6	.09	9.4	1.1	.19	e.00
31	.11	---	e.00	e.00	---	.37	---	.07	---	1.0	.17	---
TOTAL	4.10	3.27	0.99	0.00	0.00	10.64	18.18	30.44	15.80	180.9	9.16	1.71
MEAN	.13	.11	.032	.000	.000	.34	.61	.98	.53	5.84	.30	.057
MAX	.40	.15	.11	.00	.00	.89	2.6	5.0	9.4	17	.97	.15
MIN	.06	.09	.00	.00	.00	.01	.17	.07	.05	1.0	.07	.00
AC-FT	8.1	6.5	2.0	.00	.00	21	36	60	31	359	18	3.4

CAL YR 1989 TOTAL 3557.63 MEAN 9.75 MAX 450 MIN .00 AC-FT 7060
WTR YR 1990 TOTAL 275.19 MEAN .75 MAX 17 MIN .00 AC-FT 546

e Estimated

06470800 BEAR CREEK NEAR OAKES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
MAR												
27...	1600	0.28	780	8.3	8.0	2.0	250	53	28	61	33	2
AUG												
14...	1330	0.19	1440	7.7	28.0	21.0	360	62	50	170	49	4

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
27...	17	210	0	170	180	39	0.20	10	505	490	0.69
AUG											
14...	21	450	0	372	280	110	0.50	17	993	935	1.35

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
27...	0.38	3	120	50	<1	38	420	0.4	<1	1	310
AUG											
14...	0.51	5	300	40	<1	95	190	0.1	<1	<1	570

JAMES RIVER BASIN

06470830 JAMES RIVER AT OAKES, ND

LOCATION.--Lat 46°08'14", long 98°08'09", in NW¼NE¼NE¼ sec.30, T.131 N., R.59 W., Dickey County Hydrologic Unit 10160003, on left bank 10 ft downstream from bridge 1.0 mi west of Oakes.

DRAINAGE AREA.--5,320 mi², of which about 3,300 mi² is probably noncontributing.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above National Vertical Datum of 1929. Flow regulated by Jamestown Reservoir (station 06469000).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 95.20 ft, Dec. 20, 1984; minimum, 88.11 ft, Sept. 4, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 90.46 ft, Apr. 18; minimum, 88.41 ft, Sept. 22.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89.51	89.25	89.74	---	90.22	90.19	---	89.57	89.80	89.68	89.63	88.91
2	89.13	89.31	89.76	---	90.23	90.18	---	89.56	89.49	89.71	89.50	88.97
3	89.38	89.45	89.76	---	90.23	90.17	---	89.61	89.08	89.66	89.29	88.98
4	89.47	89.44	89.76	---	90.23	90.16	---	89.43	89.57	89.60	89.17	88.70
5	89.34	89.26	89.75	---	90.23	90.15	---	89.46	89.57	89.54	89.26	88.89
6	89.31	89.54	89.75	---	90.22	90.15	---	89.67	89.60	89.75	89.34	88.90
7	89.40	89.56	89.74	---	90.22	90.15	---	89.57	89.65	89.54	89.37	88.84
8	89.40	89.42	89.74	---	90.22	90.15	---	89.54	89.67	89.40	89.38	89.03
9	89.26	89.31	89.73	---	90.22	---	---	89.18	89.68	89.53	89.15	88.80
10	89.51	89.48	89.72	---	90.21	---	---	89.39	89.81	89.53	88.98	88.83
11	89.35	89.31	89.72	---	90.21	---	---	89.58	89.92	89.49	89.08	88.99
12	89.46	89.59	---	---	90.21	---	---	89.50	89.77	89.49	---	88.81
13	89.39	89.22	---	---	90.21	---	---	89.70	89.71	89.62	---	88.92
14	89.38	89.38	---	---	90.22	---	---	89.35	89.67	89.61	---	88.74
15	89.03	89.17	---	---	90.23	---	---	89.50	89.56	89.49	88.98	88.68
16	89.07	89.34	---	---	90.24	---	---	89.54	89.64	89.59	89.05	88.69
17	89.18	89.41	---	---	90.24	---	89.64	89.19	89.69	89.49	88.89	88.96
18	89.28	89.40	---	---	90.24	---	89.99	89.32	89.73	89.51	88.79	88.87
19	89.40	89.39	---	---	90.25	---	89.90	89.30	89.75	89.44	88.74	88.85
20	89.34	89.41	---	---	90.24	---	89.55	89.45	89.73	89.46	88.80	88.84
21	89.36	89.41	---	90.20	90.23	---	89.66	89.55	89.69	89.46	88.90	88.85
22	89.35	89.44	---	90.21	90.22	---	89.90	89.65	89.62	89.46	88.95	88.64
23	89.35	89.49	---	90.21	90.21	---	89.88	89.44	89.68	89.52	88.99	88.84
24	89.42	89.54	---	90.21	90.21	---	89.69	89.47	89.72	89.51	88.91	89.02
25	89.47	89.59	---	90.21	90.20	---	89.81	89.40	89.73	89.46	88.89	88.86
26	89.95	89.64	---	90.21	90.20	---	89.57	89.41	89.68	89.46	88.92	88.93
27	90.05	89.71	---	90.22	90.19	---	89.12	89.46	89.63	89.45	88.93	88.73
28	89.30	89.72	---	90.22	90.19	---	89.28	89.48	89.65	89.44	88.98	88.79
29	89.03	89.73	---	90.22	---	---	89.56	89.48	89.69	89.33	88.97	88.78
30	89.38	89.74	---	90.22	---	---	89.71	89.55	89.62	89.34	88.99	88.90
31	89.29	---	---	90.22	---	---	---	89.74	---	89.48	88.92	---
MEAN	89.37	89.45	---	---	90.22	---	---	89.49	89.66	89.52	---	88.85
MAX	90.05	89.74	---	---	90.25	---	---	89.74	89.92	89.75	---	89.03
MIN	89.03	89.17	---	---	90.19	---	---	89.18	89.08	89.33	---	88.64

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year.

PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE: Water years 1982 to current year.
WATER TEMPERATURE: Water years 1982 to current year.

INSTRUMENTATION.--Water quality monitor since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 4,430 microsiemens, Jan. 13, 1990; minimum 250, microsiemens, Apr. 14, 1989.

WATER TEMPERATURE: Maximum, 31.7 °C, Aug. 15, 1988; minimum, 0.0 °C on many days during the winter months.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 4,430 microsiemens, Jan. 13; minimum, 530 microsiemens, Apr. 1.

WATER TEMPERATURE: Maximum, 29.2 °C, July 2; minimum, 0.0 °C, on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)
NOV												
28...	1400	1200	8.2	-12.0	0.0	3.1	>20.0	--	370	78	42	120
JAN												
09...	1500	4400	7.6	5.0	0.5	5.4	17.0	118	1700	350	190	450
FEB												
20...	1600	1700	8.2	10.0	0.0	8.0	>20.0	--	--	110	54	170
MAR												
28...	1400	610	9.4	4.0	1.0	1.7	23.1	158	180	41	19	56
MAY												
23...	1000	1090	8.0	21.0	15.5	5.0	8.5	83	340	72	39	110
JUL												
10...	1300	1380	8.2	24.0	23.0	34	5.0	57	390	77	48	150
AUG												
14...	1500	1410	8.2	26.0	24.0	55	10.2	119	390	82	46	160

DATE	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)
NOV												
28...	41	3	11	338	220	65	0.20	756	739	1.03	11	--
JAN												
09...	37	5	35	1160	1000	240	0.40	2660	2960	3.62	12	--
FEB												
20...	--	--	16	458	320	110	0.30	1110	--	--	5	--
MAR												
28...	39	2	5.9	167	110	29	<0.10	383	362	0.52	5	0.010
MAY												
23...	40	3	10	306	200	59	--	712	675	0.97	117	0.020
JUL												
10...	44	3	16	358	270	110	0.20	908	887	1.23	58	--
AUG												
14...	46	4	16	278	240	110	0.30	864	822	1.18	187	0.041

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)
NOV 28...	<0.010	--	<0.100	--	0.020	--	<0.20	--	0.070	--	0.061	--
JAN 09...	<0.010	--	<0.100	--	0.170	--	1.9	--	0.300	--	0.289	--
FEB 20...	0.020	--	0.210	--	0.110	--	1.4	--	0.140	--	0.131	--
MAR 28...	<0.010	<0.100	<0.100	<0.010	<0.010	0.70	0.20	0.130	0.070	0.097	0.083	1
MAY 23...	<0.010	<0.100	<0.100	0.020	0.060	1.6	0.60	0.250	0.050	0.098	0.029	3
JUL 10...	<0.010	--	<0.100	--	0.020	--	1.2	--	0.190	--	0.148	--
AUG 14...	<0.010	<0.100	<0.100	0.110	0.020	2.7	1.1	0.300	0.180	0.247	0.137	9

DATE	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, TOTAL (UG/L AS SE) (01147)
NOV 28...	2	380	--	<1.0	1	--	<3	<1	--	27	0.3	--
JAN 09...	5	1300	--	60	3	--	40	<1	--	580	0.2	--
FEB 20...	2	500	--	2.0	<10	--	9	10	--	36	0.2	--
MAR 28...	1	190	<1	1.0	<10	130	9	<10	90	33	0.2	<1
MAY 23...	1	360	<1	<10	<1	3600	17	<1	1100	600	0.2	<1
JUL 10...	7	410	--	<10	1	--	9	<1	--	730	0.2	--
AUG 14...	8	530	<1	<10	2	3800	6	<1	1300	480	0.1	<1

DATE	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	PLANKTON BIOMASS ASH WT (MG/L) (81353)	PLANKTON BIOMASS DRY WT (MG/L) (81354)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 28...	<1	4	--	--	<0.01	--	--	--	--	62	9
JAN 09...	<1	80	--	--	<0.01	--	--	--	--	544	2
FEB 20...	<1	3	--	--	<0.01	--	--	--	--	90	50
MAR 28...	<1	<3	4.6	<0.010	<0.01	1.50	<0.500	9.5	1200	4	55
MAY 23...	<1	5	13	<0.010	<0.01	19.0	1.50	20	1100	201	53
JUL 10...	<1	<3	--	--	<0.01	--	--	--	--	109	--
AUG 14...	<1	4	22	<0.010	<0.01	16.0	1.40	31	1400	176	80

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	1110	1090	1100	1290	1270	1280	3990	3920	3950
2	---	---	---	1120	1100	1110	1330	1290	1310	4050	3990	4020
3	1060	1040	1050	1140	1120	1130	1370	1320	1340	4100	4050	4070
4	1070	1010	1050	1140	1130	1130	1390	1360	1380	4160	4100	4130
5	1070	1020	1050	1130	1080	1100	1440	1400	1420	4230	4170	4190
6	1030	1000	1020	1110	1090	1100	1480	1430	1450	4300	4220	4260
7	1040	1000	1020	1120	1090	1110	1520	1470	1490	4340	4290	4310
8	1020	1000	1010	1100	1060	1080	1560	1520	1540	4370	4310	4340
9	1030	990	1020	1060	1020	1040	1630	1570	1600	4400	4370	4390
10	1030	1000	1020	1060	1030	1040	1690	1620	1660	4410	4390	4400
11	1040	1000	1020	1050	1010	1030	1740	1680	1710	4410	4380	4400
12	1030	1000	1010	1030	1010	1020	1800	1740	1770	4420	4410	4410
13	1050	1010	1030	1050	1030	1040	1860	1790	1820	4430	4400	4410
14	1040	1010	1020	1050	1030	1040	1930	1850	1890	4400	4350	4380
15	1030	1010	1020	1040	1030	1040	2000	1930	1960	4350	4240	4300
16	1070	1010	1030	1060	1040	1050	2070	2000	2030	4240	4100	4170
17	1080	1040	1060	1090	1060	1070	2150	2070	2110	4100	3970	4040
18	1090	1050	1060	1150	1090	1120	2230	2150	2190	3970	3830	3900
19	1070	1040	1050	1190	1150	1170	2340	2230	2280	3830	3710	3770
20	1070	1040	1050	1180	1170	1170	2460	2340	2400	3710	3570	3640
21	1070	1050	1060	1180	1170	1170	2550	2460	2500	3560	3430	3500
22	1080	1050	1060	1190	1170	1180	2680	2570	2620	3430	3320	3380
23	1070	1050	1060	1190	1180	1180	2820	2680	2750	3320	3210	3270
24	1070	1050	1060	1190	1180	1180	2960	2820	2890	3200	3130	3160
25	1100	1060	1070	1200	1180	1190	3080	2960	3020	3120	3060	3100
26	1090	1070	1080	1210	1190	1200	3230	3080	3150	3060	2960	3020
27	1080	1060	1070	1210	1200	1210	3420	3240	3320	2960	2890	2930
28	1070	1060	1070	1220	1190	1200	3540	3420	3480	2890	2820	2860
29	1090	1050	1070	1240	1210	1220	3680	3570	3610	2820	2740	2780
30	1120	1080	1100	1270	1240	1250	3810	3690	3750	2750	2680	2720
31	1120	1100	1110	---	---	---	3920	3820	3860	2690	2630	2660
MONTH	---	---	---	1270	1010	1120	3920	1270	2240	4430	2630	3770

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2640	2590	2620	1470	1440	1450	570	530	550	860	850	850
2	2590	2560	2580	1450	1430	1440	560	530	540	880	850	870
3	2560	2530	2540	1440	1410	1420	580	540	560	930	880	900
4	2530	2490	2510	1430	1400	1420	580	560	570	930	900	920
5	2490	2460	2480	1420	1400	1410	610	570	590	930	910	920
6	2460	2430	2440	1410	1380	1390	660	610	640	970	920	940
7	2420	2380	2400	1380	1350	1370	---	---	---	980	950	960
8	2380	2320	2350	1360	1330	1350	---	---	---	970	940	960
9	2330	2270	2300	1340	1310	1320	---	---	---	960	950	950
10	2270	2210	2240	1310	1250	1290	---	---	---	980	950	970
11	2210	2150	2180	1270	1220	1250	---	---	---	1000	980	990
12	2160	2100	2130	1220	1140	1180	---	---	---	1050	990	1010
13	2110	2050	2080	1130	1070	1100	---	---	---	1040	1020	1030
14	2060	2000	2030	1080	1030	1050	---	---	---	1060	1030	1040
15	2000	1950	1970	1030	980	1000	---	---	---	1060	1040	1050
16	1950	1890	1920	980	940	960	---	---	---	1060	1050	1060
17	1890	1830	1860	940	910	930	810	770	790	1050	1040	1050
18	1840	1780	1810	920	860	890	820	790	800	1050	1040	1050
19	1790	1740	1760	880	840	860	800	790	800	1050	1040	1050
20	1740	1690	1710	840	810	830	830	790	810	1070	1050	1060
21	1690	1630	1670	820	780	800	850	800	820	1080	1060	1070
22	1630	1600	1620	790	740	760	860	820	840	1100	1070	1080
23	1600	1580	1590	740	700	720	880	840	860	1120	1080	1090
24	1580	1550	1570	710	700	700	880	850	860	1120	1090	1100
25	1550	1520	1540	710	680	690	870	830	850	1120	1110	1110
26	1520	1490	1510	690	640	670	850	830	840	1140	1110	1120
27	1500	1470	1480	650	620	640	840	830	840	1160	1110	1120
28	1480	1460	1470	620	590	610	850	830	840	1150	1110	1130
29	---	---	---	630	570	590	860	850	850	1160	1120	1140
30	---	---	---	590	550	570	870	850	860	1170	1130	1150
31	---	---	---	570	540	560	---	---	---	1160	1140	1150
MONTH	2640	1460	2010	1470	540	1010	---	---	---	1170	850	1030

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1190	1150	1160	1200	1160	1180	---	---	---	---	---	---
2	1170	1130	1150	1200	1170	1190	---	---	---	---	---	---
3	1140	1120	1130	1210	1180	1200	---	---	---	---	---	---
4	1170	1140	1150	1230	1180	1210	---	---	---	---	---	---
5	1180	1160	1170	1250	1200	1230	---	---	---	---	---	---
6	1180	1150	1160	1280	1220	1250	---	---	---	---	---	---
7	1180	1150	1170	1320	1260	1300	---	---	---	---	---	---
8	1190	1170	1180	1350	1300	1330	---	---	---	---	---	---
9	1210	1170	1180	1370	1320	1350	---	---	---	---	---	---
10	1230	1170	1190	1400	1340	1370	---	---	---	---	---	---
11	1220	1190	1210	1430	1390	1400	---	---	---	---	---	---
12	1230	1190	1200	1440	1390	1410	---	---	---	---	---	---
13	1220	1190	1200	1440	1400	1420	---	---	---	---	---	---
14	1200	1180	1190	1460	1410	1430	---	---	---	---	---	---
15	1190	1180	1180	1560	1430	1500	1460	1390	1420	---	---	---
16	1200	1170	1190	1590	1520	1550	1480	1420	1440	---	---	---
17	1210	1190	1200	1630	1570	1600	1490	1430	1460	---	---	---
18	1220	1180	1200	1620	1580	1600	1470	1430	1450	---	---	---
19	1230	1180	1210	1610	1560	1580	1440	1420	1430	---	---	---
20	1200	1170	1180	1580	1540	1560	1450	1420	1430	---	---	---
21	1190	1150	1170	1550	1530	1540	1440	1410	1420	---	---	---
22	1180	1150	1170	1540	1490	1520	---	---	---	---	---	---
23	1180	1150	1170	1510	1480	1490	---	---	---	---	---	---
24	1190	1160	1170	1510	1470	1490	---	---	---	---	---	---
25	1200	1160	1180	1500	1470	1480	---	---	---	---	---	---
26	1190	1160	1170	1490	1450	1470	---	---	---	---	---	---
27	1170	1150	1160	1490	1450	1470	---	---	---	1510	1490	1500
28	1190	1150	1170	1490	1430	1470	---	---	---	1540	1490	1510
29	1180	1150	1170	1430	1340	1400	---	---	---	---	---	---
30	1200	1150	1170	1450	1330	1370	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	1230	1120	1180	---	---	---	---	---	---	---	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	3.2	.8	1.9	.5	.0	.2	.4	.2	.3
2	---	---	---	2.6	.1	1.3	.5	.1	.2	.3	.1	.2
3	9.1	4.4	6.8	1.5	.1	.7	.4	.0	.2	.3	.2	.3
4	8.0	6.1	6.8	2.4	.4	1.2	.6	.0	.3	.3	.1	.2
5	9.7	5.9	7.3	2.4	1.4	2.0	.6	.1	.3	.3	.1	.2
6	9.2	5.2	7.1	4.6	1.7	3.0	.4	.1	.2	.3	.0	.1
7	9.4	4.6	7.1	3.9	2.0	3.2	.5	.0	.2	.2	.0	.1
8	9.4	6.1	7.9	3.4	1.3	2.3	.4	.0	.2	.4	.1	.2
9	10.5	7.0	8.5	3.3	.9	1.7	.8	.0	.3	.5	.3	.4
10	10.8	5.9	8.3	2.3	.1	1.0	.4	.0	.2	.4	.3	.4
11	9.7	7.7	9.0	3.5	2.0	2.6	.3	.0	.1	.3	.2	.3
12	10.0	6.2	7.8	2.9	1.4	2.2	.1	.0	.1	.2	.1	.2
13	12.5	8.2	9.5	2.2	.2	1.4	.3	.0	.1	.1	.0	.0
14	13.1	9.3	11.1	1.5	.3	.9	.2	.0	.1	.0	.0	.0
15	11.6	5.3	8.4	.9	.0	.2	.2	.0	.1	.0	.0	.0
16	8.0	3.8	5.6	.6	.0	.3	.2	.0	.1	.0	.0	.0
17	6.9	2.7	4.8	1.1	.2	.6	.2	.0	.1	.0	.0	.0
18	6.1	2.3	4.2	1.1	.9	1.0	.3	.1	.2	.0	.0	.0
19	5.8	2.7	4.2	1.8	1.1	1.3	.4	.1	.3	.0	.0	.0
20	6.6	2.2	4.2	3.3	1.7	2.3	.4	.2	.3	.0	.0	.0
21	8.4	3.7	5.9	2.9	2.3	2.6	.4	.3	.4	.0	.0	.0
22	9.2	5.7	7.3	2.4	1.4	2.1	.3	.1	.2	.0	.0	.0
23	11.0	6.5	8.5	1.5	.6	1.1	.2	.0	.0	.0	.0	.0
24	12.2	7.7	10.1	.9	.3	.6	.0	.0	.0	.0	.0	.0
25	13.9	9.2	11.6	1.1	.2	.5	.2	.0	.1	.0	.0	.0
26	15.9	13.7	14.7	.5	.1	.3	.3	.1	.2	.0	.0	.0
27	14.5	10.5	11.9	.4	.1	.2	.3	.1	.2	.0	.0	.0
28	10.9	8.2	9.6	.5	.0	.2	.4	.3	.3	.0	.0	.0
29	8.8	4.7	6.6	.6	.1	.3	.5	.3	.4	.0	.0	.0
30	5.9	2.5	4.3	.6	.1	.3	.5	.4	.5	.0	.0	.0
31	5.3	3.0	4.0	---	---	---	.4	.3	.4	.0	.0	.0
MONTH	---	---	---	4.6	.0	1.3	.8	.0	.2	.5	.0	.1

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.0	.0	.0	5.1	1.1	3.1	9.6	3.0	6.1
2	.0	.0	.0	.0	.0	.0	6.7	1.4	4.2	13.3	6.2	9.8
3	.0	.0	.0	.0	.0	.0	6.9	3.2	5.1	16.3	9.4	12.9
4	.0	.0	.0	.0	.0	.0	8.3	.6	4.8	17.8	11.0	14.2
5	.0	.0	.0	.0	.0	.0	4.8	.3	2.3	16.3	11.3	14.0
6	.0	.0	.0	.0	.0	.0	5.1	.6	3.5	18.2	11.4	14.9
7	.0	.0	.0	.0	.0	.0	---	---	---	18.9	14.5	16.2
8	.0	.0	.0	.0	.0	.0	---	---	---	17.8	12.7	15.2
9	.0	.0	.0	.1	.0	.0	---	---	---	13.3	5.9	9.6
10	.0	.0	.0	.3	.0	.1	---	---	---	13.4	4.5	9.3
11	.0	.0	.0	.1	.0	.0	---	---	---	13.1	9.7	11.7
12	.0	.0	.0	.1	.0	.0	---	---	---	17.5	10.0	13.1
13	.0	.0	.0	.0	.0	.0	---	---	---	16.4	12.6	14.8
14	.0	.0	.0	.1	.0	.0	---	---	---	15.2	11.7	13.7
15	.0	.0	.0	.0	.0	.0	---	---	---	13.8	12.7	13.3
16	.0	.0	.0	.0	.0	.0	---	---	---	12.4	8.6	11.4
17	.0	.0	.0	.0	.0	.0	10.0	3.2	6.2	13.8	6.7	10.3
18	.0	.0	.0	.0	.0	.0	9.3	5.3	7.5	10.0	8.2	9.1
19	.0	.0	.0	.0	.0	.0	11.5	6.0	8.7	10.3	7.9	9.4
20	.0	.0	.0	.2	.0	.0	15.7	8.8	12.2	15.3	9.0	12.3
21	.0	.0	.0	.2	.0	.0	17.9	11.7	14.5	15.1	12.8	13.8
22	.0	.0	.0	.1	.0	.0	19.3	14.2	17.0	18.3	12.2	14.9
23	.0	.0	.0	.5	.0	.1	20.6	16.3	18.3	21.4	14.3	17.5
24	.0	.0	.0	.6	.0	.2	19.4	15.9	18.0	22.2	17.5	19.6
25	.0	.0	.0	.7	.0	.2	19.6	16.0	17.8	18.8	15.2	17.0
26	.0	.0	.0	.8	.0	.3	17.2	11.1	15.1	20.7	14.6	17.3
27	.0	.0	.0	.9	.0	.2	10.6	1.1	5.8	22.2	16.3	18.7
28	.0	.0	.0	.5	.0	.1	6.9	.0	3.5	22.4	17.4	20.0
29	---	---	---	1.3	.0	.4	8.4	3.7	6.1	23.1	17.0	20.0
30	---	---	---	1.6	.0	.5	6.9	4.0	5.4	21.3	17.1	19.6
31	---	---	---	2.7	.0	1.4	---	---	---	19.3	17.4	18.5
MONTH	.0	.0	.0	2.7	.0	.1	---	---	---	23.1	3.0	14.1

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.6	16.4	18.8	26.7	22.1	24.7	---	---	---	---	---	---
2	19.4	10.7	16.3	29.2	24.4	26.8	---	---	---	---	---	---
3	14.7	6.9	10.7	28.9	24.1	26.8	---	---	---	---	---	---
4	17.8	11.7	14.6	26.6	21.4	24.2	---	---	---	---	---	---
5	19.2	15.3	17.2	25.4	20.2	22.8	---	---	---	---	---	---
6	20.4	14.7	17.5	24.9	20.3	22.7	---	---	---	---	---	---
7	18.3	16.0	17.0	27.4	22.2	25.0	---	---	---	---	---	---
8	18.8	14.7	16.7	25.8	21.6	23.7	---	---	---	---	---	---
9	22.8	15.7	19.6	25.2	21.6	23.5	---	---	---	---	---	---
10	24.3	19.5	21.8	25.4	22.7	23.6	---	---	---	---	---	---
11	24.6	20.4	22.4	23.0	20.6	22.0	---	---	---	---	---	---
12	25.4	20.4	22.6	24.0	18.1	21.0	---	---	---	---	---	---
13	24.7	20.5	22.6	24.6	20.0	22.3	---	---	---	---	---	---
14	20.4	17.7	19.4	24.7	19.7	22.2	---	---	---	---	---	---
15	17.3	15.2	15.8	24.3	20.7	22.5	26.0	18.5	22.1	---	---	---
16	18.2	14.8	16.6	25.1	19.9	22.2	27.3	20.0	23.6	---	---	---
17	21.4	17.5	19.4	26.0	21.2	23.6	27.1	22.0	24.7	---	---	---
18	24.4	18.7	21.0	24.7	21.5	23.2	24.9	20.6	22.7	---	---	---
19	26.2	21.2	23.8	26.2	20.6	23.2	21.0	17.5	19.5	---	---	---
20	23.5	20.3	21.9	24.2	21.0	22.0	20.1	16.9	18.3	---	---	---
21	22.8	18.9	21.0	21.5	18.7	20.2	---	---	---	---	---	---
22	21.2	18.0	19.8	21.8	17.5	19.9	---	---	---	---	---	---
23	21.9	17.9	20.4	23.5	18.3	20.5	---	---	---	---	---	---
24	24.9	20.4	22.9	25.1	19.4	21.9	---	---	---	---	---	---
25	27.1	22.7	24.6	23.9	21.6	22.8	---	---	---	---	---	---
26	26.2	23.2	25.1	26.5	21.6	23.6	---	---	---	---	---	---
27	23.8	21.8	22.7	25.3	22.9	24.3	---	---	---	---	---	---
28	27.1	21.3	24.5	26.5	22.4	24.3	---	---	---	17.1	10.9	13.4
29	24.7	22.3	23.7	24.4	20.2	22.4	---	---	---	14.5	10.2	12.3
30	27.7	22.3	25.2	23.6	18.4	21.4	---	---	---	15.5	8.7	11.8
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	27.7	6.9	20.2	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND

LOCATION.--Lat 45°56'52", long 98°10'29", in SE¼NE¼NE¼ sec.34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, on left bank, 10 ft upstream from dam, 4.5 mi southwest of Ludden and .8 mi upstream from North Dakota-South Dakota state line.

DRAINAGE AREA.--5,480 mi², of which about 3,300 mi² are noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder and concrete dam control. Datum of gage is 1,280.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 23-29, Jan. 21-27, and Aug. 23 to Sept. 4. Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by upstream reservoirs, Jamestown Reservoir (station 06469000), Pipestem Lake, capacity 147,000 acre-ft, and Lake LaMoure.

AVERAGE DISCHARGE.--9 years, 133 ft³/s, 96,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 2,300 ft³/s, Mar. 28, 1987, gage height, 13.76 ft, no flow at times during some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 271 ft³/s, Apr. 9, gage height, 10.05 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	7.9	21	1.0	2.0	5.1	151	3.5	.00	7.7	.00	e.00
2	25	2.8	25	1.0	2.0	5.5	47	3.3	60	4.9	.00	e.00
3	.02	.00	24	1.0	2.0	6.7	27	1.6	126	17	.01	e.00
4	.00	.02	21	1.0	2.0	7.4	87	19	.59	20	.66	e.00
5	5.8	19	21	1.0	2.4	8.6	113	17	2.3	19	.00	.00
6	4.8	.01	21	.36	2.4	7.2	22	1.3	2.0	3.5	.00	.00
7	.24	.00	19	.16	2.4	6.8	11	17	.18	3.2	.00	.01
8	.09	33	19	.16	2.4	7.6	5.5	14	6.1	15	.00	.00
9	28	42	15	.17	2.4	7.6	106	102	6.3	.79	.00	.00
10	.12	.69	14	.20	2.4	7.6	43	7.7	4.4	1.6	.03	.00
11	1.6	19	14	.19	2.4	8.1	17	.31	.00	28	.00	.00
12	.00	.16	14	.10	2.4	19	1.3	.37	5.2	12	.00	.00
13	.00	26	14	.01	2.7	28	1.1	.00	19	1.2	.00	.00
14	.17	1.3	12	.00	2.9	35	25	10	28	.33	.00	.00
15	53	7.3	10	.00	2.9	37	3.5	.04	49	6.5	.00	.00
16	12	.00	8.6	.00	2.9	37	77	6.7	29	.45	.00	.00
17	1.9	.00	6.9	.00	2.9	30	1.5	84	22	6.2	.00	.00
18	.01	.00	6.7	.08	2.9	30	.01	4.3	12	1.1	.00	.00
19	.00	.00	6.7	.09	2.9	33	.00	6.7	25	7.3	.00	.00
20	.00	.00	6.2	.04	2.9	36	2.2	.11	29	3.4	.00	.00
21	.00	.00	4.7	e.00	2.2	35	1.0	.00	27	3.1	.00	.00
22	.00	.00	3.9	e.05	4.1	33	.22	.00	38	2.4	.00	.33
23	.00	e.10	2.7	e.10	4.1	32	.00	.38	18	.12	e.00	.00
24	.00	e.50	2.4	e.50	3.5	32	.01	.13	8.4	.03	e.00	.00
25	.00	e1.0	2.4	e1.0	3.5	38	.45	.26	7.9	.04	e.00	.00
26	.00	e5.0	2.0	e1.2	3.7	39	51	1.9	13	.00	e.00	.00
27	.00	e10	1.6	e1.5	4.6	42	157	1.7	20	.02	e.00	.00
28	.45	e15	1.3	1.6	5.7	49	44	2.6	17	1.1	e.00	.00
29	38	e21	1.3	1.7	---	52	5.1	1.6	9.8	6.2	e.00	.00
30	.03	21	1.3	2.0	---	48	1.3	.04	21	1.2	e.00	.00
31	1.8	---	1.3	2.0	---	42	---	.00	---	.00	e.00	---
TOTAL	196.03	232.78	324.0	18.21	81.6	805.2	1001.19	307.54	606.17	173.38	0.70	0.34
MEAN	6.32	7.76	10.5	.59	2.91	26.0	33.4	9.92	20.2	5.59	.023	.011
MAX	53	42	25	2.0	5.7	52	157	102	126	28	.66	.33
MIN	.00	.00	1.3	.00	2.0	5.1	.00	.00	.00	.00	.00	.00
AC-FT	389	462	643	36	162	1600	1990	610	1200	344	1.4	.7

CAL YR 1989 TOTAL 22283.50 MEAN 61.1 MAX 1350 MIN .00 AC-FT 44200
WTR YR 1990 TOTAL 3747.14 MEAN 10.3 MAX 157 MIN .00 AC-FT 7430

e Estimated

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year.

PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE: October 1982 to current year.
PH: June 1983 to current year.
WATER TEMPERATURE: October 1982 to current year.
DISSOLVED OXYGEN: October 1982 to current year.

INSTRUMENTATION.--Water quality monitor since October 1982.

REMARKS.--Unpublished records for dissolved oxygen and pH are available in files at the District office for water years 1983 through 1987. No flow for many days (see table of daily mean discharges for this station).

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum recorded, 2,770 microsiemens, Mar. 18, 1989; minimum recorded, 217 microsiemens, July 13, 1983.
PH: Maximum recorded, 9.7 units, Oct. 10, 1984; minimum recorded, 6.0 units, Nov. 20, 1984.
WATER TEMPERATURE: Maximum, 31.2°C, Aug. 3, 1989; minimum, 0.0°C, several days during winter months each year.
DISSOLVED OXYGEN: Maximum recorded, greater than 20 mg/L on many days; minimum recorded, 0.0 mg/L, on many days.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 2,690 microsiemens, Mar. 7; minimum, 580 microsiemens, May 20.
PH: Maximum, 9.2 units, Oct. 3; minimum, 7.2 units, May 29, June 30, and July 2.
WATER TEMPERATURE: Maximum, 29.1°C, July 3; minimum, 0.0°C, Nov. 15.
DISSOLVED OXYGEN: Maximum, greater than 20 mg/L on many days; minimum, 0.0 mg/L, on many days.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
NOV												
29...	1100	21	1380	8.4	0.5	2.0	3.4	14.0	99	360	65	49
JAN												
10...	0930	0.20	2220	8.2	2.0	1.5	5.0	14.7	105	650	120	85
FEB												
21...	1000	1.0	2470	8.6	4.0	2.5	4.1	22.0	159	790	150	100
MAR												
28...	1100	45	880	8.8	4.0	7.0	12	21.5	173	250	51	30
MAY												
15...	0800	0.10	810	8.2	10.0	14.0	15	10.3	99	230	44	28
JUL												
11...	0900	16	1050	8.2	21.0	22.5	42	5.5	62	250	41	35

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
NOV												
29...	160	47	4	17	349	280	95	0.30	927	877	1.26	52.8
JAN												
10...	280	47	5	27	576	460	150	0.40	1490	1470	2.03	0.80
FEB												
21...	310	45	5	26	669	560	180	0.40	1810	1730	2.46	4.89
MAR												
28...	91	43	3	10	225	180	53	<0.10	592	550	0.81	72.1
MAY												
15...	91	45	3	12	217	130	40	0.20	481	476	0.65	0.13
JUL												
11...	120	50	3	15	228	230	79	0.30	658	659	0.89	28.6

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P) (70507)
NOV 29...	4	--	<0.010	--	<0.100	--	0.040	--	1.6	--	0.270	--
JAN 10...	7	--	<0.010	--	<0.100	--	0.200	--	2.0	--	0.510	--
FEB 21...	17	--	<0.010	--	<0.100	--	0.050	--	1.5	--	0.340	--
MAR 28...	19	0.020	<0.010	<0.100	<0.100	0.020	<0.010	1.1	0.60	0.150	0.050	0.075
MAY 15...	35	0.020	<0.010	<0.100	<0.100	0.010	0.020	1.7	0.60	0.590	0.040	0.078
JUL 11...	73	--	<0.010	--	<0.100	--	0.150	--	0.90	--	0.320	--

DATE	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
NOV 29...	0.245	--	4	500	--	<1.0	1	--	<3	<1	--	60
JAN 10...	0.524	--	4	670	--	<10	1	--	30	<1	--	240
FEB 21...	0.271	--	3	680	--	<10	2	--	20	<1	--	470
MAR 28...	0.049	1	1	250	<1	1.0	<10	800	7	<10	250	44
MAY 15...	0.014	1	1	290	<1	<10	1	1300	10	<1	590	38
JUL 11...	0.265	--	7	410	--	<10	<1	--	12	<1	--	79

DATE	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	ALDRIN, DIS-SOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AME-TRYNE TOTAL (82184)	ATRA-ZINE, TOTAL (UG/L) (39630)
NOV 29...	0.6	--	<1	<3	--	--	<0.01	--	--	--	--	--
JAN 10...	0.1	--	<1	<10	--	--	<0.01	--	--	--	--	--
FEB 21...	0.2	--	<1	<10	--	--	<0.01	--	--	--	--	--
MAR 28...	0.2	<1	<1	<3	9.4	<0.010	<0.01	--	--	--	--	--
MAY 15...	0.1	<1	<1	3	13	<0.010	<0.01	<0.10	<0.01	<0.010	<0.10	0.10
JUL 11...	0.1	--	<1	<3	--	--	<0.01	--	--	--	--	--

DATE	CHLOR-DANE, DIS-SOLVED (UG/L) (39352)	CHLOR-DANE, TOTAL (UG/L) (39350)	CYAN-AZINE TOTAL (UG/L) (81757)	DDD, DIS-SOLVED (UG/L) (39361)	DDD, TOTAL (UG/L) (39360)	DDE, DIS-SOLVED (UG/L) (39366)	DDE, TOTAL (UG/L) (39365)	DDT, DIS-SOLVED (UG/L) (39371)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)
MAY 15...	<0.1	<0.1	<0.10	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01

DATE	DI-ELDRIN TOTAL (UG/L) (39380)	ENDO-SULFAN DISSOLV (UG/L) (82354)	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, DIS-SOLVED (UG/L) (39391)	ENDRIN, TOTAL (UG/L) (39390)	ETHION DISSOLV (UG/L) (82346)	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, DIS-SOLVED (UG/L) (39411)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE DIS-SOLVED (UG/L) (39421)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE DIS-SOLVED (UG/L) (39341)
MAY 15...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	LINDANE TOTAL (UG/L) (39340)	MALATHION, DISSOLVED (UG/L) (39532)	MALATHION, TOTAL (UG/L) (39530)	METHOMYL TOTAL (UG/L) (39051)	METHOXYCHLOR DISSOLV (UG/L) (82350)	METHOXYCHLOR, TOTAL (UG/L) (39480)	METHYL PARATHION, DISSOLVED (UG/L) (39602)	METHYL PARATHION, TOTAL (UG/L) (39600)	METHYL-TRITHION DISSOLV (UG/L) (82344)	METHYL TRITHION, TOTAL (UG/L) (39790)	METOLACHLOR WATER WHOLE TOT.REC (UG/L) (82612)	METRIBUZIN WATER WHOLE TOT.REC (UG/L) (82611)
MAY 15...	<0.010	<0.01	<0.01	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1

DATE	MIREX, DISSOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PARATHION, DISSOLVED (UG/L) (39542)	PARATHION, TOTAL (UG/L) (39540)	PCB, DISSOLVED (UG/L) (39517)	PCB, TOTAL (UG/L) (39516)	PCN DISSOLV (UG/L) (82360)	PERTHANE DISSOLV (UG/L) (82348)	PERTHANE TOTAL (UG/L) (39034)	PHORATE OTAL (UG/L) (39023)	PROMETONE TOTAL (UG/L) (39056)
MAY 15...	<0.01	<0.01	<0.10	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1

DATE	PROMETRYNE TOTAL (UG/L) (39057)	PROPAZINE TOTAL (UG/L) (39024)	PROPHAM TOTAL (UG/L) (39052)	SEVIN, TOTAL (UG/L) (39750)	SILVEX, TOTAL (UG/L) (39760)	SIMAZINE TOTAL (UG/L) (39055)	SIMETRYNE TOTAL (UG/L) (39054)	TOXAPHENE, DISSOLVED (UG/L) (39401)	TOXAPHENE, TOTAL (UG/L) (39400)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)	TRITHION DISSOLV (UG/L) (82342)
MAY 15...	<0.1	<0.10	<0.5	<0.50	<0.01	<0.10	<0.1	<1.0	<1	<0.10	<0.01

DATE	TOTAL TRITHION (UG/L) (39786)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	PLANKTON BIOMASS ASH WT (MG/L) (81353)	PLANKTON BIOMASS DRY WT (MG/L) (81354)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 29...	--	--	--	--	--	--	--	--	50	2.8	61
JAN 10...	--	--	--	--	--	--	--	--	46	0.02	79
FEB 21...	--	--	--	--	--	--	--	--	149	0.40	9
MAR 28...	--	--	--	--	5.70	<0.500	14	1200	22	2.7	85
MAY 15...	<0.01	0.05	<0.01	<0.01	31.0	<0.500	27	1200	53	0.01	94
JUL 11...	--	--	--	--	--	--	--	--	70	3.0	95

DATE	1-NAPHTHOL (UG/L) (LC1351a)	3-HYDROXYCARBOFURAN (UG/L) (LC1353a)	ALDICARB (UG/L) (LC1338a)	ALDICARB SULFONE (UG/L) (LC1344a)	ALDICARB SULFOXIDE (UG/L) (LC1343a)	CARBARYL (UG/L) (LC0636a)	CARBOFURAN (UG/L) (LC1337a)	METHOMYL TOTAL (UG/L) (LC0638a)	OXAMYL (UG/L) (LC1335a)	PROPHAM TOTAL (UG/L) (LC0637a)
MAY 15...	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

a - Lab Code. WATSTORE parameter code unavailable.

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	---	---	---	---	---	---	2320	2260	2290
2	1130	1100	1110	---	---	---	---	---	---	2330	2270	2300
3	1140	1100	1130	---	---	---	1340	1140	1260	2320	2280	2290
4	---	---	---	---	---	---	---	---	---	2320	2280	2300
5	1150	1120	1140	---	---	---	---	---	---	2330	2290	2310
6	1180	1120	1130	---	---	---	---	---	---	2370	2310	2340
7	1180	1120	1170	---	---	---	1270	1080	1230	2350	2330	2340
8	1190	1150	1170	---	---	---	1360	1060	1190	2350	2320	2320
9	1210	1160	1170	---	---	---	1320	1120	1270	2330	2280	2310
10	1220	1180	1180	---	---	---	1290	1090	1210	2310	2270	2300
11	1220	1180	1190	---	---	---	1450	1090	1270	2290	2250	2280
12	---	---	---	---	---	---	1460	1260	1400	2330	2250	2300
13	---	---	---	---	---	---	2100	1290	1560	2330	2290	2310
14	---	---	---	1490	1170	1330	1590	1360	1520	---	---	---
15	---	---	---	1330	1090	1290	1750	1550	1650	---	---	---
16	1640	1060	1230	---	---	---	1840	1720	1770	---	---	---
17	1620	1060	1250	---	---	---	1880	1770	1830	---	---	---
18	1740	1120	1400	---	---	---	1920	1820	1870	2260	2210	2240
19	---	---	---	---	---	---	1980	1890	1940	2250	2220	2240
20	---	---	---	---	---	---	2040	1930	2000	2240	2210	2220
21	---	---	---	---	---	---	2090	2000	2050	---	---	---
22	---	---	---	---	---	---	2160	2070	2120	2240	2160	2180
23	---	---	---	1580	1380	1520	2220	2140	2180	2210	2160	2180
24	---	---	---	1550	1430	1510	2260	2190	2220	2200	2150	2170
25	---	---	---	1580	1380	1520	2260	2200	2230	2180	2010	2170
26	---	---	---	---	---	---	2280	2230	2260	2160	2070	2110
27	---	---	---	---	---	---	2270	2250	2260	2150	2030	2100
28	---	---	---	1380	1100	1300	2270	2220	2250	2130	2090	2110
29	---	---	---	---	---	---	2280	2230	2260	2110	2020	2090
30	---	---	---	---	---	---	2290	2260	2270	2110	2050	2080
31	---	---	---	---	---	---	2290	2260	2280	2100	2040	2080
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2120	2060	2090	2600	2510	2560	---	---	---	---	---	---
2	2130	2080	2110	2590	2530	2570	---	---	---	---	---	---
3	2180	2120	2150	2600	2470	2530	---	---	---	720	680	740
4	2200	2140	2170	2630	2550	2590	---	---	---	710	700	740
5	2240	2160	2200	2620	2570	2600	---	---	---	730	730	750
6	2220	2150	2200	2650	2580	2620	---	---	---	---	---	---
7	2220	2180	2200	2690	2600	2640	760	730	750	---	---	---
8	2220	2180	2200	2680	2520	2620	760	740	750	770	680	760
9	2210	2160	2190	2660	2500	2600	760	680	740	790	660	770
10	2210	2150	2190	2660	2530	2600	730	660	700	800	680	780
11	2200	2160	2180	2640	2320	2490	700	660	680	810	730	780
12	2190	2130	2170	2530	1870	2190	---	---	---	800	720	790
13	2190	2130	2170	2250	1790	1900	---	---	---	---	---	---
14	2220	2140	2190	2220	1570	1820	---	---	---	---	---	---
15	2250	2170	2220	1830	1110	1510	---	---	---	---	---	---
16	2330	2200	2270	1600	970	1290	---	---	---	730	710	720
17	2360	2280	2320	1660	1000	1230	---	---	---	760	720	730
18	2410	2320	2370	1660	890	1230	---	---	---	760	590	750
19	2450	2380	2410	1260	980	1150	---	---	---	760	600	750
20	2480	2390	2450	1340	1060	1180	---	---	---	770	580	750
21	2510	2440	2470	1240	810	1090	---	---	---	---	---	---
22	2540	2440	2500	1090	760	860	---	---	---	---	---	---
23	2540	2440	2510	950	750	860	---	---	---	810	640	780
24	2580	2490	2550	1010	880	930	---	---	---	810	650	790
25	2590	2520	2550	1000	880	950	---	---	---	810	650	800
26	2610	2530	2570	1020	870	960	---	---	---	820	720	810
27	2620	2570	2580	1030	870	940	---	---	---	830	720	810
28	2610	2530	2580	1020	910	950	---	---	---	840	680	820
29	---	---	---	1100	940	1050	---	---	---	840	720	830
30	---	---	---	---	---	---	---	---	---	850	750	840
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	2620	2060	2310	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	1020	820	1010	---	---	---	---	---	---
2	860	640	830	1030	860	1020	---	---	---	---	---	---
3	880	630	850	1040	860	1030	---	---	---	---	---	---
4	880	790	870	1030	840	1020	---	---	---	---	---	---
5	880	750	870	1040	800	1020	---	---	---	---	---	---
6	890	710	880	1050	830	1040	---	---	---	---	---	---
7	890	720	890	1080	840	1060	---	---	---	---	---	---
8	900	740	890	1090	890	1060	---	---	---	---	---	---
9	910	860	900	---	---	---	---	---	---	---	---	---
10	920	810	910	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	930	800	910	1060	1030	1050	---	---	---	---	---	---
13	940	780	930	1080	1040	1060	---	---	---	---	---	---
14	950	840	940	1080	1050	1060	---	---	---	---	---	---
15	950	780	930	1090	1050	1070	---	---	---	---	---	---
16	950	820	940	1100	1060	1080	---	---	---	---	---	---
17	970	810	950	1120	1080	1090	---	---	---	---	---	---
18	970	880	960	1120	1090	1100	---	---	---	---	---	---
19	970	860	950	1120	1090	1100	---	---	---	---	---	---
20	970	800	960	1130	1090	1110	---	---	---	---	---	---
21	990	890	980	1130	1090	1110	---	---	---	---	---	---
22	1000	800	990	1130	1090	1110	---	---	---	---	---	---
23	1000	930	980	1140	1100	1120	---	---	---	---	---	---
24	980	850	970	1150	1120	1130	---	---	---	---	---	---
25	1000	900	980	1140	1120	1120	---	---	---	---	---	---
26	1010	820	990	---	---	---	---	---	---	---	---	---
27	1000	820	990	1120	1090	1110	---	---	---	---	---	---
28	1000	810	990	1130	1100	1110	---	---	---	---	---	---
29	1000	830	990	1130	1090	1110	---	---	---	---	---	---
30	1010	840	1000	1140	1120	1130	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

PH (STANDARD UNITS), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8.4	7.9	8.9	8.8	8.7	8.7	8.2	8.1	7.8	7.8	8.5	8.4
2	8.5	8.3	8.9	8.8	8.7	8.6	8.2	8.1	7.8	7.8	8.5	8.4
3	9.2	8.2	---	---	8.7	8.6	8.1	8.0	7.8	7.8	8.5	8.4
4	---	---	8.9	8.8	8.7	8.6	8.1	8.0	7.8	7.8	8.5	8.4
5	8.7	7.9	9.0	8.8	8.6	8.5	8.1	8.0	8.2	7.8	8.5	8.4
6	8.7	8.0	9.0	8.7	8.6	8.5	8.0	8.0	8.2	8.2	8.5	8.4
7	8.5	8.0	---	---	8.5	8.5	8.0	7.9	8.3	8.2	8.5	8.4
8	8.3	8.0	9.0	8.8	8.5	8.5	8.0	7.9	8.3	8.2	8.4	8.3
9	8.8	8.0	9.0	8.8	8.6	8.5	7.9	7.9	8.3	8.2	8.5	8.3
10	8.7	8.2	9.0	8.8	8.6	8.5	8.3	7.9	8.3	8.2	8.6	8.4
11	8.7	8.2	8.9	8.8	8.6	8.5	8.3	8.2	8.3	8.2	8.7	8.5
12	---	---	---	---	8.6	8.5	8.2	8.2	8.3	8.2	8.6	8.3
13	---	---	---	---	8.6	8.5	8.2	8.1	8.3	8.2	8.5	8.3
14	8.4	8.1	---	---	8.7	8.5	---	---	8.3	8.2	8.6	8.4
15	8.9	8.2	---	---	8.3	8.2	---	---	8.4	8.3	8.6	8.5
16	8.9	8.5	---	---	8.3	8.2	---	---	8.4	8.3	8.7	8.6
17	8.9	8.5	---	---	8.3	8.3	---	---	8.4	8.4	8.8	8.6
18	8.8	8.5	---	---	8.3	8.3	8.0	7.9	8.5	8.4	8.8	8.6
19	---	---	---	---	8.3	8.3	8.0	7.9	8.6	8.5	8.7	8.6
20	---	---	---	---	8.3	8.3	8.0	7.9	8.7	8.6	8.7	8.6
21	---	---	---	---	8.3	8.3	---	---	8.6	8.5	8.7	8.6
22	---	---	---	---	8.3	8.3	7.9	7.9	8.6	8.5	8.7	8.6
23	---	---	---	---	8.3	8.3	7.9	7.8	8.5	8.5	8.7	8.6
24	---	---	---	---	8.3	8.3	7.9	7.8	8.5	8.5	8.7	8.2
25	---	---	---	---	8.3	8.3	7.8	7.5	8.5	8.5	8.7	8.3
26	---	---	---	---	8.3	8.2	7.8	7.6	8.5	8.4	8.7	8.3
27	---	---	---	---	8.3	8.2	7.9	7.8	8.5	8.4	8.7	8.4
28	8.8	8.2	---	---	8.3	8.2	7.9	7.8	8.5	8.4	8.9	8.6
29	8.8	8.5	---	---	8.3	8.2	7.9	7.8	---	---	9.0	8.7
30	8.8	8.5	8.7	8.7	8.2	8.2	7.9	7.8	---	---	---	---
31	8.9	8.6	---	---	8.2	8.2	7.9	7.8	---	---	---	---
MONTH	---	---	---	---	8.7	8.2	---	---	8.7	7.8	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

PH (STANDARD UNITS), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	---	---	7.8	7.3	---	---	---	---
2	---	---	---	---	8.1	7.5	7.8	7.2	---	---	---	---
3	---	---	8.5	8.2	8.2	8.0	---	---	---	---	---	---
4	---	---	8.6	8.2	8.2	8.0	---	---	---	---	---	---
5	---	---	8.6	8.1	8.4	8.0	---	---	---	---	---	---
6	---	---	---	---	8.2	7.9	---	---	---	---	---	---
7	8.7	8.4	---	---	8.0	7.9	---	---	---	---	---	---
8	8.6	8.5	8.7	8.1	8.2	8.0	---	---	---	---	---	---
9	8.7	8.4	8.7	8.3	8.2	7.7	---	---	---	---	---	---
10	8.7	8.5	8.7	8.0	8.1	7.6	---	---	---	---	---	---
11	8.7	8.6	8.7	8.1	---	---	---	---	---	---	---	---
12	---	---	8.6	7.8	---	---	8.4	8.0	---	---	---	---
13	---	---	---	---	8.2	7.8	7.9	7.6	---	---	---	---
14	---	---	---	---	8.4	8.1	---	---	---	---	---	---
15	---	---	8.4	8.3	8.4	8.3	---	---	---	---	---	---
16	---	---	8.4	8.3	8.5	8.2	---	---	---	---	---	---
17	---	---	8.4	8.3	8.5	8.2	---	---	---	---	---	---
18	---	---	8.4	8.2	8.6	8.3	---	---	---	---	---	---
19	---	---	8.2	8.0	8.6	8.5	---	---	---	---	---	---
20	---	---	8.3	8.0	8.6	8.5	---	---	---	---	---	---
21	---	---	---	---	8.8	8.2	---	---	---	---	---	---
22	---	---	---	---	8.8	8.6	---	---	---	---	---	---
23	---	---	8.2	8.0	8.8	8.4	---	---	---	---	---	---
24	---	---	8.1	7.8	8.8	8.5	---	---	---	---	---	---
25	---	---	8.1	7.9	8.6	8.2	---	---	---	---	---	---
26	---	---	7.9	7.6	8.6	8.0	---	---	---	---	---	---
27	---	---	7.8	7.6	8.2	8.0	---	---	---	---	---	---
28	---	---	7.9	7.6	8.2	8.0	---	---	---	---	---	---
29	---	---	7.9	7.2	8.0	7.8	---	---	---	---	---	---
30	---	---	8.3	7.5	7.8	7.2	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	17.1	11.0	14.6	4.7	2.7	3.4	2.9	2.6	2.8	2.0	1.6	1.8
2	11.0	7.8	9.2	3.3	1.5	2.5	2.8	2.3	2.7	1.9	1.7	1.8
3	16.6	6.8	8.6	---	---	---	2.6	2.0	2.3	1.9	1.8	1.9
4	---	---	---	3.3	1.4	2.2	2.6	2.0	2.3	1.9	1.7	1.8
5	9.8	6.7	8.0	3.1	2.2	2.7	3.0	2.0	2.6	1.8	.9	1.7
6	9.3	7.0	8.2	5.2	3.6	3.8	3.1	2.4	2.8	1.6	1.5	1.6
7	10.0	6.5	8.2	---	---	---	3.1	2.4	2.8	1.8	1.6	1.7
8	10.8	6.9	8.9	4.0	2.0	2.9	2.7	2.2	2.6	1.8	1.5	1.7
9	10.1	8.4	9.3	3.3	2.0	2.7	2.6	2.1	2.3	1.8	1.7	1.8
10	10.6	7.0	9.4	3.7	1.8	2.7	2.7	2.3	2.5	1.9	1.0	1.6
11	10.5	8.9	9.7	3.7	2.8	3.3	2.6	1.9	2.3	1.8	1.0	1.4
12	---	---	---	3.2	1.3	2.7	2.7	2.1	2.4	1.9	1.4	1.6
13	---	---	---	3.1	1.0	2.0	2.7	2.2	2.5	2.0	1.8	1.9
14	14.3	9.6	11.7	2.3	1.2	1.7	2.7	2.1	2.3	---	---	---
15	13.0	7.6	9.7	1.8	.0	.7	2.4	2.0	2.2	---	---	---
16	8.2	6.3	7.1	---	---	---	2.4	2.0	2.2	---	---	---
17	7.1	4.8	6.1	---	---	---	2.3	2.0	2.1	---	---	---
18	7.2	4.1	5.3	---	---	---	2.2	1.9	2.0	2.6	2.3	2.5
19	---	---	---	---	---	---	2.0	1.8	1.9	2.6	2.4	2.5
20	---	---	---	---	---	---	1.9	1.8	1.8	2.6	2.4	2.5
21	---	---	---	---	---	---	1.9	1.6	1.7	---	---	---
22	---	---	---	---	---	---	1.8	1.6	1.7	2.6	2.0	2.5
23	---	---	---	3.1	1.6	2.5	1.7	1.5	1.6	2.8	2.0	2.5
24	---	---	---	3.0	2.5	2.6	1.8	1.6	1.8	2.7	2.3	2.5
25	---	---	---	3.2	2.4	2.7	2.0	1.7	1.9	2.6	2.2	2.4
26	---	---	---	3.4	2.9	3.1	1.9	1.7	1.8	2.7	2.0	2.5
27	---	---	---	3.6	3.2	3.4	2.1	1.7	1.9	2.8	1.4	2.4
28	11.5	9.6	10.6	3.6	2.5	3.0	2.2	1.8	2.0	3.0	2.4	2.8
29	10.1	6.7	7.7	3.4	2.2	3.1	2.1	1.8	1.9	3.0	2.1	2.8
30	6.8	5.0	6.0	2.9	2.5	2.8	2.0	1.8	1.9	3.1	2.2	2.7
31	6.0	2.9	5.1	---	---	---	1.9	1.8	1.8	2.9	2.5	2.8
MONTH	---	---	---	---	---	---	3.1	1.5	2.2	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.8	2.5	2.6	4.3	2.6	3.2	---	---	---	---	---	---
2	2.7	2.4	2.6	3.6	2.8	3.2	---	---	---	---	---	---
3	2.6	2.2	2.4	4.2	3.0	3.4	---	---	---	15.4	10.0	12.6
4	2.5	2.2	2.3	4.0	3.2	3.6	---	---	---	16.4	12.0	14.4
5	3.0	2.0	2.4	4.2	3.6	3.8	---	---	---	17.2	12.8	14.6
6	2.7	2.0	2.3	4.2	3.8	4.0	---	---	---	---	---	---
7	2.8	2.2	2.4	4.3	3.9	4.1	7.2	3.1	4.9	---	---	---
8	3.0	2.3	2.6	4.3	3.5	4.0	8.4	4.7	6.4	17.6	10.8	14.2
9	3.1	1.9	2.5	4.5	3.4	4.0	7.9	5.8	6.9	12.0	7.6	9.6
10	2.8	2.6	2.7	5.0	4.2	4.6	6.4	3.4	5.0	13.7	10.1	11.9
11	3.2	2.6	2.8	4.9	4.4	4.7	4.7	1.9	3.3	15.3	11.8	13.4
12	2.8	2.1	2.6	4.7	3.5	4.2	---	---	---	17.3	13.3	15.5
13	2.7	2.0	2.4	4.0	3.4	3.6	---	---	---	---	---	---
14	3.0	2.3	2.6	4.1	3.2	3.5	---	---	---	---	---	---
15	2.6	2.0	2.4	3.5	2.3	3.0	---	---	---	16.6	11.8	14.5
16	2.6	2.0	2.4	3.2	2.4	2.7	---	---	---	13.7	9.3	12.6
17	2.6	2.1	2.3	3.4	2.3	2.8	---	---	---	12.8	6.6	10.4
18	2.8	2.3	2.5	3.8	2.5	3.1	---	---	---	11.4	8.3	10.2
19	2.9	2.4	2.6	4.4	2.9	3.6	---	---	---	10.0	7.2	9.3
20	2.8	2.5	2.5	6.0	3.6	4.8	---	---	---	15.0	7.6	11.1
21	3.0	2.2	2.7	6.0	4.6	5.2	---	---	---	---	---	---
22	2.7	2.4	2.5	5.2	3.5	4.3	---	---	---	---	---	---
23	2.9	2.1	2.5	6.4	3.4	4.8	---	---	---	22.2	13.6	18.5
24	3.1	2.0	2.6	7.0	5.0	6.0	---	---	---	20.7	16.6	19.6
25	3.0	2.3	2.6	7.6	5.8	6.7	---	---	---	19.4	15.2	17.5
26	3.0	2.4	2.7	8.3	6.2	7.2	---	---	---	20.7	15.3	17.4
27	3.2	1.9	2.7	8.6	6.4	7.6	---	---	---	23.0	16.7	19.6
28	3.7	2.6	3.0	7.6	6.9	7.4	---	---	---	22.9	16.2	20.7
29	---	---	---	8.7	7.1	8.0	---	---	---	22.8	18.4	20.8
30	---	---	---	---	---	---	---	---	---	21.5	18.2	20.0
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	3.7	1.9	2.5	---	---	---	---	---	---	---	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	26.9	14.1	25.4	---	---	---	---	---	---
2	20.2	11.4	17.4	28.9	21.2	26.4	---	---	---	---	---	---
3	13.2	7.5	11.4	29.1	22.6	27.2	---	---	---	---	---	---
4	16.7	9.9	13.9	27.1	21.2	25.8	---	---	---	---	---	---
5	18.6	13.8	16.7	25.5	18.1	23.7	---	---	---	---	---	---
6	19.8	14.6	17.6	24.9	18.2	23.5	---	---	---	---	---	---
7	18.3	14.6	17.1	27.4	19.1	25.0	---	---	---	---	---	---
8	18.6	14.0	16.9	26.7	20.0	24.8	---	---	---	---	---	---
9	21.4	16.4	18.6	---	---	---	---	---	---	---	---	---
10	23.8	18.2	21.5	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	24.7	19.2	22.4	24.3	20.6	22.4	---	---	---	---	---	---
13	24.3	18.7	22.1	26.1	21.4	23.6	---	---	---	---	---	---
14	22.7	17.9	20.7	26.2	21.4	23.8	---	---	---	---	---	---
15	19.4	14.8	17.5	25.4	22.3	23.9	---	---	---	---	---	---
16	18.2	14.2	16.8	27.1	22.0	24.4	---	---	---	---	---	---
17	20.8	16.0	18.9	26.6	23.1	24.7	---	---	---	---	---	---
18	22.7	18.9	20.2	25.7	23.2	24.5	---	---	---	---	---	---
19	25.0	13.4	21.7	26.2	21.9	23.7	---	---	---	---	---	---
20	23.7	18.6	22.2	24.3	22.3	22.9	---	---	---	---	---	---
21	23.0	20.1	21.7	22.2	20.5	21.4	---	---	---	---	---	---
22	21.8	17.6	20.7	22.7	19.4	20.9	---	---	---	---	---	---
23	25.2	19.2	21.4	24.4	20.1	21.9	---	---	---	---	---	---
24	24.2	17.7	21.7	26.3	20.8	23.5	---	---	---	---	---	---
25	25.8	21.6	23.2	25.9	23.1	24.7	---	---	---	---	---	---
26	28.8	19.4	25.1	---	---	---	---	---	---	---	---	---
27	25.5	19.8	23.9	26.4	24.9	25.5	---	---	---	---	---	---
28	27.4	19.2	24.4	26.3	24.4	25.2	---	---	---	---	---	---
29	26.9	21.0	25.1	24.8	23.1	24.1	---	---	---	---	---	---
30	27.8	20.5	25.4	24.4	21.2	22.8	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.3	3.2	7.7	14.4	11.4	13.2	14.5	13.2	13.6	---	---	---
2	12.6	8.1	10.8	15.9	11.4	14.3	---	---	---	---	---	---
3	13.9	2.0	9.3	---	---	---	---	---	---	---	---	---
4	---	---	---	17.0	15.2	15.8	---	---	---	---	---	---
5	12.8	4.7	9.6	15.5	13.1	13.8	---	---	---	---	---	---
6	12.9	4.2	9.0	14.6	11.6	13.6	---	---	---	---	---	---
7	12.4	4.8	7.2	---	---	---	---	---	---	---	---	---
8	14.4	4.3	7.6	14.1	11.9	13.5	---	---	---	---	---	---
9	12.1	5.6	9.7	13.7	13.0	13.4	---	---	---	---	---	---
10	11.9	3.0	7.4	14.7	11.2	13.2	---	---	---	---	---	---
11	12.3	3.0	7.0	14.2	11.7	13.5	---	---	---	>20.0	19.0	20.0
12	---	---	---	14.2	12.9	13.6	---	---	---	>20.0	7.9	15.3
13	---	---	---	14.8	13.4	14.1	---	---	---	---	---	---
14	15.0	5.9	8.9	15.5	13.6	14.4	---	---	---	---	---	---
15	12.5	5.7	10.5	15.0	13.9	14.5	---	---	---	---	---	---
16	13.5	9.3	11.7	---	---	---	---	---	---	---	---	---
17	14.2	7.9	10.5	---	---	---	---	---	---	---	---	---
18	10.5	7.6	9.3	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	15.0	13.7	14.4	---	---	---	---	---	---
24	---	---	---	13.9	12.1	12.7	---	---	---	---	---	---
25	---	---	---	13.3	12.4	12.7	---	---	---	---	---	---
26	---	---	---	12.8	12.1	12.5	---	---	---	---	---	---
27	---	---	---	12.4	11.8	12.0	---	---	---	---	---	---
28	11.0	3.3	4.7	13.9	11.9	12.9	---	---	---	---	---	---
29	13.3	7.8	11.5	15.3	12.3	13.3	---	---	---	---	---	---
30	9.1	5.7	7.0	14.3	13.6	14.0	---	---	---	---	---	---
31	13.9	8.2	9.7	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	>20.0	>20.0	>20.0	---	---	---	---	---	---
2	---	---	---	>20.0	>20.0	>20.0	---	---	---	---	---	---
3	---	---	---	>20.0	>20.0	>20.0	---	---	---	17.0	10.8	14.4
4	---	---	---	>20.0	>20.0	>20.0	---	---	---	13.8	9.9	12.6
5	---	---	---	>20.0	>20.0	>20.0	---	---	---	14.2	9.2	12.1
6	>20.0	17.5	19.4	>20.0	>20.0	>20.0	---	---	---	---	---	---
7	>20.0	19.4	>20.0	>20.0	>20.0	>20.0	12.5	10.9	11.9	---	---	---
8	>20.0	19.5	>20.0	>20.0	>20.0	>20.0	11.8	8.5	11.2	13.0	11.3	12.2
9	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	11.6	7.6	10.8	13.8	10.7	12.6
10	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	12.6	10.6	11.7	14.0	10.9	12.9
11	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	12.9	11.0	12.2	14.8	9.6	13.4
12	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	15.5	10.2	12.8
13	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
14	>20.0	18.2	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
15	>20.0	14.6	17.5	>20.0	>20.0	>20.0	---	---	---	15.0	6.6	11.8
16	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	14.5	3.1	11.2
17	>20.0	15.6	>20.0	>20.0	>20.0	>20.0	---	---	---	16.0	14.0	15.1
18	>20.0	16.7	>20.0	>20.0	>20.0	>20.0	---	---	---	15.2	3.5	9.8
19	>20.0	13.8	18.8	>20.0	>20.0	>20.0	---	---	---	15.3	5.4	11.6
20	>20.0	19.4	>20.0	>20.0	>20.0	>20.0	---	---	---	13.8	2.5	6.7
21	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
22	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
23	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	13.5	1.3	7.2
24	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	12.3	1.3	6.4
25	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	11.2	1.3	5.6
26	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	13.6	1.3	6.8
27	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	13.5	1.2	5.6
28	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	12.7	1.2	7.1
29	---	---	---	>20.0	>20.0	>20.0	---	---	---	9.8	1.2	5.4
30	---	---	---	---	---	---	---	---	---	9.1	1.2	4.2
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	1.5	.1	1.3	---	---	---	---	---	---
2	13.4	1.2	7.6	1.3	1.1	1.3	---	---	---	---	---	---
3	15.4	11.5	14.5	2.6	1.1	1.4	---	---	---	---	---	---
4	12.9	1.4	7.9	6.2	1.1	2.2	---	---	---	---	---	---
5	11.7	1.2	6.6	4.2	1.1	2.2	---	---	---	---	---	---
6	10.2	1.3	4.3	9.4	1.3	5.4	---	---	---	---	---	---
7	9.0	1.3	3.9	10.7	1.2	4.4	---	---	---	---	---	---
8	12.0	1.3	5.9	11.8	2.0	8.0	---	---	---	---	---	---
9	9.8	3.8	6.2	---	---	---	---	---	---	---	---	---
10	9.2	1.3	5.7	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	4.2	1.2	1.8	9.3	4.4	6.6	---	---	---	---	---	---
13	6.5	1.3	3.3	9.1	2.5	5.3	---	---	---	---	---	---
14	7.8	1.3	3.3	10.4	.0	4.2	---	---	---	---	---	---
15	8.2	2.7	5.1	7.7	.3	3.9	---	---	---	---	---	---
16	9.2	1.4	5.2	7.9	.1	3.1	---	---	---	---	---	---
17	9.3	1.3	4.5	8.1	.2	3.5	---	---	---	---	---	---
18	5.6	1.3	2.2	4.1	.0	1.5	---	---	---	---	---	---
19	6.6	.8	2.8	8.7	.1	4.3	---	---	---	---	---	---
20	6.6	1.3	3.1	6.3	.0	2.4	---	---	---	---	---	---
21	4.9	1.3	2.2	7.2	.4	3.2	---	---	---	---	---	---
22	8.1	1.3	3.0	8.4	.4	3.2	---	---	---	---	---	---
23	8.6	1.3	2.4	5.9	.4	2.1	---	---	---	---	---	---
24	4.8	1.2	1.7	5.3	.1	2.3	---	---	---	---	---	---
25	3.3	1.2	1.4	3.7	.2	1.3	---	---	---	---	---	---
26	11.9	1.1	3.1	---	---	---	---	---	---	---	---	---
27	4.0	1.1	1.4	---	---	---	---	---	---	---	---	---
28	3.8	1.1	1.6	3.8	.0	1.2	---	---	---	---	---	---
29	1.4	1.1	1.3	5.9	.3	2.6	---	---	---	---	---	---
30	4.3	1.2	1.6	3.2	.3	1.0	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470878 JAMES RIVER AT ND-SD STATE LINE

LOCATION.--Lat 45°56'10", long 98°10'26", in $SE^1/_4SE^1/_4$ sec. 34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, at bridge on North Dakota-South Dakota state line road 6.5 mi south, and 1 mi west from Ludden.

DRAINAGE AREA.--5,480 mi^2, approximately, revised, of which about 3,300 mi^2 is probably noncontributing.

GAGE HEIGHT RECORDS

PERIOD OF RECORD.--October 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,200 ft above National Geodetic Vertical Datum of 1929.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed, 93.60 ft, Mar. 28, 1987; minimum observed, 86.45 ft, Oct. 3, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum, 88.98 ft, Apr. 18; minimum observed, 87.09 ft, Oct. 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87.59	---	---	---	---	---	---	88.51	88.64	88.56	88.35	87.79
2	---	---	---	---	---	---	---	88.50	88.42	88.55	88.22	87.84
3	---	---	---	---	---	---	---	88.54	88.45	88.50	87.98	87.94
4	---	---	---	---	---	---	---	88.37	88.58	88.44	87.84	87.70
5	---	---	---	---	---	---	---	88.40	88.52	88.40	87.90	87.76
6	---	---	---	---	---	---	---	88.56	88.52	88.54	88.00	87.77
7	---	---	---	---	---	---	---	88.45	88.55	88.43	88.08	87.70
8	---	---	---	---	---	---	---	88.41	88.54	88.26	88.10	87.84
9	---	---	---	---	---	---	---	88.27	88.52	88.35	87.86	87.70
10	---	---	---	---	---	---	---	88.39	88.60	88.34	87.74	87.66
11	---	---	---	---	---	---	---	88.55	88.70	88.30	87.76	87.77
12	---	---	---	---	---	---	---	88.46	88.51	88.28	87.73	87.69
13	---	---	---	---	---	---	---	88.62	88.45	88.37	87.77	87.74
14	---	---	---	---	---	---	---	88.30	88.43	88.36	87.78	87.51
15	---	---	---	---	---	---	---	88.47	88.46	88.25	87.71	87.55
16	---	---	---	---	---	---	---	88.39	88.54	88.30	87.83	87.49
17	---	---	---	---	---	---	---	88.21	88.59	88.22	87.76	87.65
18	---	---	---	---	---	---	---	88.33	88.61	88.23	87.73	87.72
19	---	---	---	---	---	---	88.62	88.30	88.67	88.17	87.78	87.62
20	---	---	---	---	---	---	88.25	88.45	88.66	88.18	87.80	87.64
21	---	---	---	---	---	---	88.34	88.54	88.63	88.17	87.89	87.63
22	---	---	---	---	---	---	88.59	88.61	88.60	88.16	87.94	87.53
23	---	---	---	---	---	---	88.52	88.42	88.60	88.20	87.99	87.50
24	---	---	---	---	---	---	88.36	88.45	88.61	88.21	87.92	87.68
25	---	---	---	---	---	---	88.43	88.39	88.60	88.19	87.90	87.64
26	---	---	---	---	---	---	88.27	88.36	88.57	88.21	87.89	87.62
27	88.11	---	---	---	---	---	88.23	88.35	88.57	88.17	87.87	87.56
28	87.56	---	---	---	---	---	88.33	88.35	88.54	88.15	87.87	87.51
29	---	---	---	---	---	---	88.49	88.36	88.57	88.04	87.88	87.50
30	---	---	---	---	---	---	88.61	88.44	88.52	88.03	87.89	87.53
31	---	---	---	---	---	---	---	88.57	---	88.16	87.83	---
MEAN	---	---	---	---	---	---	---	88.43	88.56	88.28	87.89	87.66
MAX	---	---	---	---	---	---	---	88.62	88.70	88.56	88.35	87.94
MIN	---	---	---	---	---	---	---	88.21	88.42	88.03	87.71	87.49

06470980 JAMES RIVER NEAR HECLA, SD

LOCATION.--Lat 45°53'34", long 98°10'13", in SW¼SE¼SE¼ sec. 16, T.128 N., R.61 W., Brown County, South Dakota, Hydrologic Unit 10160003, on left bank 30 ft upstream from bridge on county road 1.0 mi northwest of Hecla, South Dakota, and 3.0 mi downstream from the North Dakota - South Dakota border.

DRAINAGE AREA.--5,520 mi² approximately, of which about 3,300 mi² is probably noncontributing.

GAGE HEIGHT RECORDS

PERIOD OF RECORD.--February 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records of stream velocity and discharge are also collected at this location. These records which have been used to supplement the discharge record for station 06740875, James River at Dakota Lake Dam near Ludden, N.Dak., are available in the files of the District office.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 92.72 ft, Apr. 1, 1987; minimum, 86.15 ft, Sept. 18, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 88.65, May 22; minimum, 86.74 ft, Oct. 29.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87.37	86.84	87.32	87.37	87.35	87.38	87.69	88.32	88.42	88.41	88.11	87.70
2	87.03	86.89	87.35	87.37	87.35	87.39	87.71	88.40	88.42	88.40	88.03	87.72
3	87.01	86.98	87.36	87.37	87.35	87.39	87.72	88.42	88.47	88.40	87.87	87.78
4	87.06	87.00	87.37	87.36	87.36	87.39	87.74	88.32	88.44	88.34	87.78	87.60
5	87.08	86.95	87.38	87.36	87.36	87.39	87.75	88.33	88.45	88.29	87.81	87.69
6	86.96	87.04	87.39	87.35	87.36	87.40	87.77	88.43	88.42	88.33	87.86	87.67
7	87.00	87.07	87.39	87.35	87.36	87.40	87.79	88.39	88.41	88.30	87.89	87.61
8	86.98	87.17	87.40	87.35	87.36	87.40	87.81	88.33	88.46	88.20	87.89	87.73
9	87.03	87.08	87.42	87.35	87.37	87.41	87.83	88.28	88.41	88.23	87.73	87.57
10	87.03	87.06	87.42	87.34	87.37	87.41	87.85	88.33	88.40	88.22	87.64	87.57
11	87.01	87.00	87.43	87.34	87.37	87.42	87.86	88.42	88.50	88.22	87.70	87.66
12	87.03	87.09	87.43	87.33	87.37	87.43	87.88	88.35	88.39	88.19	87.57	87.54
13	86.97	87.04	87.45	87.33	87.37	87.44	87.90	88.45	88.34	88.23	87.69	87.61
14	86.92	86.97	87.46	87.33	87.37	87.45	87.92	88.25	88.33	88.22	87.62	87.47
15	86.93	87.04	87.46	87.33	87.37	87.47	87.94	88.31	88.37	88.15	87.62	87.45
16	86.82	87.04	87.45	87.32	87.38	87.48	87.96	88.41	88.44	88.15	87.68	87.44
17	86.86	87.07	87.44	87.32	87.38	87.50	87.97	88.28	88.50	88.13	87.56	87.59
18	86.92	87.05	87.44	87.32	87.38	87.52	87.99	88.24	88.48	88.11	87.65	87.52
19	87.02	87.06	87.43	87.32	87.37	87.53	88.02	88.22	88.56	88.07	87.69	87.53
20	87.02	87.05	87.42	87.31	87.37	87.55	88.05	88.34	88.57	88.07	87.73	87.51
21	86.97	87.04	87.41	87.31	87.37	87.57	88.06	88.39	88.53	88.07	87.79	87.54
22	87.00	87.05	87.40	87.32	87.37	87.58	88.08	88.46	88.52	88.05	87.81	87.40
23	86.92	87.05	87.39	87.32	87.38	87.59	88.10	88.31	88.49	88.08	87.84	87.49
24	86.95	87.05	87.39	87.32	87.38	87.60	88.12	88.30	88.48	88.05	87.81	87.60
25	87.06	87.06	87.39	87.32	87.37	87.61	88.13	88.26	88.47	88.04	87.77	87.50
26	87.34	87.07	87.38	87.33	87.38	87.62	88.14	88.26	88.44	88.06	87.78	87.52
27	87.77	87.17	87.38	87.33	87.38	87.63	88.15	88.25	88.44	88.04	87.78	87.39
28	87.17	87.24	87.38	87.34	87.38	87.64	88.17	88.25	88.43	88.04	87.79	87.43
29	86.86	87.28	87.38	87.34	---	87.65	88.19	88.23	88.44	87.96	87.78	87.40
30	86.88	87.30	87.37	87.35	---	87.66	88.22	88.28	88.41	87.95	87.77	87.48
31	86.91	---	87.37	87.35	---	87.68	---	88.33	---	88.02	87.73	---
MEAN	87.03	87.06	87.40	87.34	87.37	87.50	87.95	88.33	88.45	88.16	87.77	87.56
MAX	87.77	87.30	87.46	87.37	87.38	87.68	88.22	88.46	88.57	88.41	88.11	87.78
MIN	86.82	86.84	87.32	87.31	87.35	87.38	87.69	88.22	88.33	87.95	87.56	87.39

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)
NOV 29...	1400	1520	8.3	2.0	0.5	3.6	15.6	106	380	65	53	180
JAN 10...	1200	2980	8.0	6.0	1.0	1.5	8.2	58	830	150	110	390
FEB 21...	1100	2410	8.3	10.0	1.0	2.4	24.0	168	720	130	96	310
MAR 28...	0900	860	8.6	2.0	1.0	20	11.4	78	240	48	30	89
MAY 23...	1300	850	8.0	25.0	19.0	5.7	9.5	100	240	48	29	89
JUL 10...	1500	1000	9.0	30.0	24.5	7.4	7.0	82	240	41	33	120

DATE	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
NOV 29...	49	4	19	359	310	100	992	943	1.35	12	--	<0.010
JAN 10...	49	6	36	798	640	220	2090	2030	2.84	5	--	<0.010
FEB 21...	47	5	26	635	510	180	1700	1630	2.31	13	--	<0.010
MAR 28...	43	2	11	209	170	50	555	525	0.75	45	0.030	<0.010
MAY 23...	43	3	12	239	150	51	550	523	0.75	14	<0.010	<0.010
JUL 10...	50	3	16	237	210	75	656	639	0.89	7	--	<0.010

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
NOV 29...	--	<0.100	--	0.040	--	1.5	--	0.170	--	0.118	--	3
JAN 10...	--	<0.100	--	0.320	--	2.9	--	0.590	--	0.620	--	5
FEB 21...	--	<0.100	--	0.041	--	2.1	--	0.430	--	0.271	--	4
MAR 28...	<0.100	<0.100	0.650	0.600	3.8	2.2	0.300	0.080	0.135	0.081	1	1
MAY 23...	<0.100	<0.100	<0.010	0.090	1.5	0.70	0.410	0.250	0.285	0.176	3	3
JUL 10...	--	<0.100	--	0.020	--	0.90	--	0.480	--	0.450	--	15

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)
NOV 29...	510	--	<1.0	1	--	5	<1	--	46	0.2	--
JAN 10...	940	--	<10	3	--	20	<1	--	160	0.2	--
FEB 21...	670	--	<10	3	--	20	<1	--	100	0.3	--
MAR 28...	240	5	<1.0	<10	2000	17	<10	860	510	0.2	<1
MAY 23...	310	<1	<10	<1	300	10	1	650	87	0.3	<1
JUL 10...	410	--	<10	<1	--	6	<1	--	240	0.1	--

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)	PLANK-TON BIOMASS ASH WT (MG/L) (81353)	PLANK-TON BIOMASS DRY WT (MG/L) (81354)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 29...	<1	4	--	--	<0.01	--	--	--	--	27	39
JAN 10...	<1	20	--	--	<0.01	--	--	--	--	98	26
FEB 21...	<1	<10	--	--	<0.01	--	--	--	--	121	5
MAR 28...	<1	3	11	<0.010	<0.01	21.0	0.900	15	1200	45	92
MAY 23...	<1	<3	9.4	<0.010	<0.01	8.40	<0.200	15	1100	14	57
JUL 10...	<1	3	--	--	<0.01	--	--	--	--	10	65

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, ND, Hydrologic Unit 10160004, on left bank 0.4 mi upstream from State line, 7.8 mi northeast of Frederick, SD, and 15.7 mi upstream from mouth.

DRAINAGE AREA.--716 mi², of which about 332 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR SD-86-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,365 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to June 14, 1962, nonrecording gage at site 0.4 mi downstream at datum 0.94 ft lower.

REMARKS.--Records good.

AVERAGE DISCHARGE.--34 years, 19.6 ft³/s, 14,200 acre-ft/yr; median of yearly mean discharges, 12 ft³/s, 8,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft³/s, Apr. 11, 1969; maximum gage height, 16.05 ft, Apr. 11, 1969, backwater from ice; no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--No flow during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1989 TOTAL 5747.38 MEAN 15.7 MAX 800 MIN .00 AC-FT 11400
WTR YR 1990 TOTAL 0.00 MEAN .000 MAX .00 MIN .00 AC-FT .00

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 U.S. Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other site not included in the partial-record program. These measurements are generally made in times 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 presented in 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 second table.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but it 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 (mi^2)	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN					
	Red River at Grand Forks, ND	Lat 47°56'34", long 97°03'10", in SW¼NE¼ sec.33, T.152 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on left bank 2.3 mi downstream from Red Lake River. (Previous site of Red River at Grand Forks).	30,100	1882-1983 1987-90	04-04-90	12.30	4,880
05083000	Turtle River at Manvel, ND	Lat 48°04'43", long 97°11'03", in SE¼ sec.10, T.153 N., R.51 W., Grand Forks County, Hydrologic Unit 09020307, on left bank 10 ft downstream from bridge on State Highway No. 33, 0.3 mi west of Manvel, and 10 mi upstream from mouth.	613	1945-70#, 1972-73, 1980-90	04-05-90	7.29	70
05083500	Red River of the North at Oslo, MN	Lat 48°11'40", long 97°08'30", in SW¼SW¼ sec.36, T.155 N., R.51 W., Walsh County, Hydrologic Unit 09020306, on bridge crossing the Red River 0.5 mi west of Oslo, MN.	31,200	1936-37#, 1941-43#, 1945-60#, 1985-90	04-05-90	15.64	4,900
05102490	Red River of the North at Pembina, ND	Lat 48°58'17", long 97°14'16", in NE¼ sec.4, T.163 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on bridge crossing the Red River 0.2 mi north Pembina.	40,200	1985-90	04-10-90	761.75	5,470b
		SOURIS RIVER BASIN					
05119410	Bonnes Coulee at Velva, ND	Lat 48°03'30", long 100°57'00", in NE¼SW¼ sec. 21, T.153 N., R.80 W., McHenry County, at culvert on U.S. Highway 52, 0.5 mi west of Velva.	53.0	1962, 1965, 1971-73, 1976-77, 1987-90	07-03-90	3.65	600a

\# - Operated as a continuous-record gaging station
a - Estimate
b - Discharge determined using record from station 2 mi downstream.

Annual maximum discharge at crest-stage partial-record stations

Station no.	Station Name	Location	Drainage area (mi^2)	Period of record	Annual maximum: Date	Annual maximum: Gage height (ft)	Annual maximum: Discharge (ft^3/s)
		KNIFE RIVER BASIN					
06340200	West Branch Otter Creek near Beulah, ND	Lat 47°08'05", long 101°39'35", in $NW^1/_4NW^1/_4SW^1/_4$ sec.12, T.142 N., R.87 W., Oliver County, Hydrologic Unit 10130201, on right bank 10 mi northeast of Beulah.	26.5	1965-83#, 1984-90	06-29-90	4.34	52
06339490	Elm Creek near Golden Valley, ND	Lat 47°06'25", long 102°03'05", in $SE^1/_4NW^1/_4$ sec.23, T.142 N., R.90 W., Mercer County, Hydrologic Unit 10130201, at bridge on county road, 13.5 mi south of Golden Valley.	82.0	1967-81# 1982-90	07-01-90	4.65	45
		HEART RIVER BASIN					
06343000	Heart River near South Heart, ND	Lat 46°51'56", long 102°56'53", in $NE^1/_4SE^1/_4SW^1/_4$sec.8, T.139 N., R.97 W., Stark County, Hydrologic Unit 10130202, on left bank 1.7 mi downstream from North Creek, 2 mi east of South Heart and 5.5 mi upstream from Edward Arthur Patterson Lake.	311	1965-84#, 1985-90	07-12-90	5.78	242

- Operated as a continuous-record gaging station

Miscellaneous discharge measurement sites

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1990

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
RED RIVER OF THE NORTH BASIN						
Sheyenne River[b]	Red River of the North	Lat 46°37'48", long 97°56'22", in NW¼NW¼NE¼ sec.2, T.136 N., R.58 W., Ransom County, Hydrologic Unit 09020204, on Hwy. 46 bridge, 3 mi south of Kathryn.	---	1989	05-15-90 05-30-90 06-28-90 07-12-90 08-10-90 09-05-90	15.4 12.5 50.2 27.3 40.9 28.7
Sheyenne River[b]	Red River of the North	Lat 46°22'02", long 97°33'47", in NW¼NW¼NE¼ sec.2, T.133 N., R.55 W., Ransom County, Hydrologic Unit 09020204, 150 ft upstream from bridge on county road, 7.4 mi southeast of Lisbon at river mi 148.	---	1963[a], 1983-89	04-24-90 05-16-90 05-31-90 06-28-90 07-12-90 08-10-90 09-06-90	21.0 16.6 15.1 53.1 26.4 8.53 28.4
Sheyenne River[b]	Red River of the North	Lat 46°30'54", long 97°29'23", in SE¼SE¼SE¼ sec.8, T.135 N., R.54 W., Ransom County, Hydrologic Unit 09020204, 30 ft upstream from county highway bridge, 5 mi south of Sheldon at river mi 114.	---	1963[a], 1983-89	04-24-90 05-16-90 05-30-90 06-28-90 07-12-90 08-10-90 09-06-90	24.8 17.7 15.7 60.8 29.9 5.58 30.2
Sheyenne River[b]	Red River of the North	Lat 46°31'01", long 97°20'33", in NW¼SW¼SW¼ sec.10, T.135 N., R.53 W., Ransom County, Hydrologic Unit 09020204, on bridge, 7 mi east and 5 mi south of Sheldon.	---	1983-89	04-24-90 05-16-90 05-31-90 06-28-90 07-12-90 08-10-90 09-06-90	38.4 30.8 23.8 74.3 25.8 5.17 36.3
MISSOURI RIVER BASIN						
Bear Den Creek above mouth near Mandaree, ND 06332517[a]	Missouri River Mainstem	Lat 47°48'47", long 102°42'57", in SW¼SW¼NE¼ sec.16, T.150 N., R.94 W., McKenzie County, Hydrologic Unit 10110101, 5.5 mi north and 2 mi west of Mandaree and 34 mi north of Killdeer.	116	---	08-27-90 09-20-90	.52 .76
East Fork Shell Creek near mouth below Parshall, ND 06332524[a]	Missouri River Mainstem	Lat 47°56'02", long 102°15'47", in NE¼NW¼NE¼ sec.1, T.151 N., R.91 W., Mountrail County, Hydrologic Unit 10110101, 5.5 mi west and 1 mi south of Parshall	376	---	04-18-90 05-17-90 06-19-90 07-13-90 08-16-90 09-17-90	1.50 1.28 1.46 1.56 .26 0
Deepwater Creek at mouth near Raub, ND 06332770[a]	Missouri River Mainstem	Lat 47°43'15", long 102°06'14", in NE¼NE¼SE¼ sec.7, T.149 N., R.89 W., McLean County, Hydrologic Unit 10110101, 5 mi west and 0.6 mi south of Raub	220	---	04-18-90 05-17-90 06-19-90 07-13-90 08-17-90 09-17-90	.50 1.53 <.005 <.005 0 0
Little Missouri River[b]	Missouri River	Lat 46°35'33", long 103°30'53", in SE¼NE¼SE¼ sec.17, T.136 N., R.012 W., Slope County, Hydrologic Unit 10110203, 10 mi west and 8 mi north of Amidon.	---	1985-89	11-08-89 05-01-90 06-07-90 06-27-90 07-24-90 07-31-90 08-21-90 09-26-90	114 35.9 163 42.1 39.6 56.0 78.5 .39

a - Data collected by U.S. Geological Survey.
b - Current year measurements furnished by and previous measurement data available from the North Dakota State Water Commission unless otherwise noted.

Discharge measurements made at miscellaneous sites during water year 1990--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		LITTLE MISSOURI RIVER BASIN				
Little Missouri River at Medora, ND 06336000[b]	Missouri River	Lat 46°55'10", long 103°31'40", in $NE^1/_4NW^1/_4NE^1/_4$ sec. 27, T.140 N., R.102 W., Billings County, Hydrologic Unit 10110203, on bridge on county highway in Medora.	6,190	1903-08#[a], 1921-24#[a], 1928-34#[a], 1945-75#[a], 1976[a], 1985-89	03-27-90	257
					05-01-90	44.6
					06-07-90	202
					06-27-90	65.9
					07-24-90	61.0
					08-21-90	197
					09-26-90	1.40
Moccasin Creek at mouth near Mandaree, ND 06337470[a]	Little Missouri River	Lat 47°36'00", long 102°30'38", in $NE^1/_4SW^1/_4NE^1/_4$ sec.34, T.147 N., R.93 W., Dunn County, Hydrologic Unit 109110205, 10 mi south and 8 mi east of Mandaree	53	---	04-18-90	.02
					05-16-90	.02
					06-18-90	.04
					07-11-90	.03
					08-27-90	.04
					09-20-90	.02
Squaw Creek above mouth near Mandaree, ND 06337480[a]	Little Missouri River	Lat 47°38'27", long 102°30'40", in $NW^1/_4SW^1/_4NE^1/_4$ sec.15, T.148 N., R.93 W., Dunn County, Hydrologic Unit 10110205, 7 mi south and 8 mi east of Mandaree	58	---	04-18-90	.04
					05-16-90	.08
					06-18-90	2.76
					07-11-90	.03
					08-27-90	0
					09-20-90	0
		KNIFE RIVER BASIN				
Crooked Creek[b]	Knife River	Lat 47°09'52", long 102°41'37", in $NW^1/_4SW^1/_4NW^1/_4$ sec.35, T.143 N., R.95 W., Dunn County, Hydrologic Unit 10130201, 4 mi south and 4 mi east of Manning	---	1988-89	03-27-90	1.40
					05-01-90	1.00
					06-06-90	.33
					06-27-90	.30
		HEART RIVER BASIN				
Green River[b]	Heart River	Lat 46°58'06", long 102°44'54", in $SE^1/_4NE^1/_4SE^1/_4$ sec.2, T.140 N., R.95 W., Stark County, Hydrologic Unit 10130202, 4 mi north and 2 mi east of Dickinson.	---	1989	03-26-90	5.42
					04-30-90	3.32
					06-05-90	2.85
					06-26-90	9.74
					08-21-90	1.06
					09-26-90	1.24
Green River near Gladstone, ND 06345000[b]	Heart River	Lat 46°53'31", long 102°37'01", in $SE^1/_4SW^1/_4SE^1/_4$ sec.36, T.140 N., R.95 W., Stark County, Hydrologic Unit 10130202, 7 mi east of Dickinson.	356	1945-76[a], 1988-89	03-26-90	8.50
					04-30-90	5.18
					06-05-90	3.75
					06-26-90	14.1
					07-24-90	1.18
					08-21-90	.26
					09-26-90	.12
Heart River[b]	Missouri River	Lat 46°36'57", long 101°15'11", in $NW^1/_4NW^1/_4NW^1/_4$ sec.9, T.136 N., R.84 W., Morton County, Hydrologic Unit 10130203, 2 mi west and 11 mi north of Flasher.	---	---	06-13-90	10.5
					06-20-90	45.7
					06-26-90	10.2
					07-06-90	11.1
					07-13-90	35.5
					07-25-90	60.5
					08-06-90	46.8
					08-22-90	70.9
					09-05-90	24.0
					09-27-90	16.2
Heart River[b]	Missouri River	Lat 46°45'20", long 101°11'05", in $SW^1/_4SW^1/_4NE^1/_4$ sec.20, T.138 N., R.83 W., Morton County, Hydrologic Unit 10130203, 4 mi south and 13 mi west of Mandan.	---	---	06-06-90	15.7
					06-13-90	1.96
					06-20-90	51.0
					06-26-90	6.13
					07-06-90	14.3
					07-13-90	17.0
					07-25-90	62.3
					08-06-90	30.3
					08-22-90	81.3
					09-05-90	25.9
					09-27-90	16.9

\# - Operated as a continuous-record gaging station.
a - Data collected by U.S. Geological Survey.
b - Current year measurements furnished by and previous measurement data available from North Dakota State Water Commission unless otherwise noted.

Discharge measurements made at miscellaneous sites during water year 1990--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		GRAND RIVER BASIN				
North Fork Grand River at Bowman-Haley tailwater[a]	Grand River	Lat 46°01'55", long 103°14'39", in $NW^1/_4SW^1/_4NW^1/_4$ sec.19, T.129 N., R.100 W., Bowman County, Hydrologic Unit 10130301, 1/8 mi below Bowman-Haley Dam.	---	1988	07-16-90	0.72
		APPLE CREEK BASIN				
Long Lake Creek[b]	Apple Creek	Lat 46°33'37", long 100°07'09", in $SW^1/_4SE^1/_4SW^1/_4$ sec.28, T.136 N., R.75 W., Emmons County, Hydrologic Unit 10130103, 0.5 mi south and 1.25 mi west of Braddock.	---	1989	10-09-89	.72
					11-14-89	2.75
					04-20-90	3.55
					05-21-90	4.87
					06-12-90	2.48
					07-10-90	.96
					07-26-90	.40
Long Lake Creek[b]	Apple Creek	Lat 46°35'52", long 100°11'26", in $SE^1/_4SW^1/_4NW^1/_4$ sec.13, T.136 N., R.76 W., Emmons County, Hydrologic Unit 10130103, 5 mi west and 1.5 mi north of Braddock.	---	1989	10-09-89	.30
					11-14-89	2.24
					04-20-90	4.61
					05-21-90	4.59
					06-12-90	3.42
					07-10-90	1.75
		CANNONBALL RIVER BASIN				
Cannonball River below Bentley, ND 06351000[b]	Missouri River	Lat 46°21'30", long 102°02'30", in $SW^1/_4SW^1/_4$ sec.6, T.133 N., R.90 W., Grant County, Hydrologic Unit 10130204, 2 mi northeast of Bentley.	1,140	1951-813#[a], 1988-89	04-30-90	12.6
					06-05-90	8.9
					06-26-90	8.6
					07-25-90	2.24
					08-22-90	9.28
					09-27-90	1.09
Cannonball River[b]	Missouri River	Lat 46°07'35", long 101°19'57", in $SW^1/_4SW^1/_4NW^1/_4$ sec.33, T.131 N., R.85 W., Grant County, Hydrologic Unit 10130204, 16 mi south of Raleigh.	---	1989	04-30-90	11.1
					06-05-90	18.3
					06-26-90	2.16
					07-25-90	2.25
					08-22-90	111
					09-27-90	.14
Cedar River near Pretty Rock, ND 06352500[b]	Cannonball River	Lat 46°01'55", long 101°49'55", in $SW^1/_4SW^1/_4SW^1/_4$ sec.33, T.130 N., R.89 W., Grant County, Hydrologic Unit 10130205, 7 mi north of Keldron, SD.	1,340	1943-763#[a] 1988-89	03-26-90	28.8
					04-30-90	6.53
					06-05-90	2.96
					06-26-90	0.57

- Operated as a continuous-record gaging station.
a - Data collected by U.S. Geological Survey.
b - Current year measurements furnished by and previous measurement data available from North Dakota State Water Commission unless otherwise noted.

Water-quality partial-record stations are particular sites where chemical-quality, biological and/or ediment data are collected systematically over a period of years for use in hydrologic analyses. These data re collected usually less than quarterly. Samples collected at sites other than gaging stations and artial-record stations to give better areal coverage in a river basin are referred to as miscellaneous sites.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
RED RIVER OF THE NORTH BASIN												
05083000 TURTLE RIVER AT MANVEL, N. DAK. (LAT 48 04 43N LONG 097 11 03W)												
APR 13..	1150	56	206	8.1	5.0	7.0	490	120	46	330	58	6
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)												
APR 18..	1210	1900	63	8.3	3.0	4.0	240	55	26	26	18	0.7
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)												
MAY 01..	0840	0.30	242	8.2	1.5	3.0	620	130	72	350	54	6
JUL 10..	1500	12	125	7.9	27.0	24.0	350	80	36	140	46	3
KNIFE RIVER BASIN												
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)												
JUN 20..	1115	0.32	205	8.2	24.5	20.0	260	43	38	410	76	11
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)												
APR 04..	1352	0.03	120	8.3	11.5	8.0	410	88	45	130	41	3
HEART RIVER BASIN												
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)												
APR 09..	1215	0.68	174	8.4	1.0	6.5	120	25	15	340	85	13

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE, FET-LAB (MG/L AS HCO3) (95440)	CAR-BONATE, FET-LAB (MG/L AS CO3) (95445)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
RED RIVER OF THE NORTH BASIN											
05083000 TURTLE RIVER AT MANVEL, N. DAK. (LAT 48 04 43N LONG 097 11 03W)											
APR 13..	18	210	0	170	360	510	0.50	13	1600	1500	2.18
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR 18..	9.1	230	0	180	81	32	0.20	12	363	352	0.49
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)											
MAY 01..	12	540	0	439	910	19	0.20	11	1740	1770	2.37
JUL 10..	10	340	0	278	410	9.5	0.10	17	902	870	1.23
KNIFE RIVER BASIN											
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
JUN 20..	14	580	0	472	710	8.5	0.40	0.0	1560	1510	2.12
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
APR 04..	6.1	360	0	293	370	6.7	0.20	2.4	822	825	1.12
HEART RIVER BASIN											
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
APR 09..	5.6	450	0	370	480	12	0.50	7.0	1130	1110	1.54

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
RED RIVER OF THE NORTH BASIN											
05083000 TURTLE RIVER AT MANVEL, N. DAK. (LAT 48 04 43N LONG 097 11 03W)											
APR 13..	240	5	560	60	1	140	280	0.1	2	<1	1700
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR 18..	1860	2	80	80	1	23	40	<0.1	2	<1	320
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)											
MAY 01..	1.41	2	260	40	<1	170	30	0.1	<1	<1	950
JUL 10..	29.2	1	160	50	<1	73	170	0.1	<1	<1	650
KNIFE RIVER BASIN											
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
JUN 20..	1.35	3	270	50	1	57	10	0.1	<1	1	880
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
APR 04..	0.07	1	130	20	<1	28	150	0.1	1	1	1100
HEART RIVER BASIN											
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
APR 09..	2.07	3	450	40	<1	24	10	<0.1	2	<1	500

GROUND-WATER LEVELS

BENSON COUNTY

480228098482501. Local number, 153-063-30CBC.
LOCATION.--Lat 48°02'28", long 098°48'25", Hydrologic Unit 09020201.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 200 ft, cased to 137 ft, plastic pipe, No. 18 slot screen set 137 to 143 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,445 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.32 ft below land-surface datum, June 15, 1987; lowest measured, 22.30 ft below land-surface datum, Mar. 3, 1971.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 29	17.37	MAR 13	17.63	JUNE 21	17.39	AUG 16	18.05

BENSON COUNTY

480958099154801. Local number, 154-067-15BBB.
LOCATION.--Lat 48°09'58", long 099°15'48", Hydrologic Unit 09020201.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 147 ft, plastic pipe, No. 18 slot screen set 147 to 153 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,475 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.19 ft below land-surface datum, May 26, 1983; lowest measured, 34.23 ft below land-surface datum, Aug. 29, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 30	33.59	MAR 13	33.74	JUNE 19	33.84	AUG 29	34.23

BENSON COUNTY

481041099442701. Local number, 154-071-11AAD1.
LOCATION.--Lat 48°10'41", long 099°44'27", Hydrologic Unit 09020202.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 100 ft, cased to 42 ft, plastic pipe, No. 12 slot screen set 42 to 45 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,590 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--August 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.41 ft below land-surface datum, July 12, 1982; lowest measured, 9.27 ft below land-surface datum, June 8, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 29	8.82	MAR 13	9.05	JUNE 20	7.89	AUG 29	8.12

BOWMAN COUNTY

461534103491701. Local number, 132-105-16BDB.
LOCATION.--Lat 46°15'34", long 103°49'17", Hydrologic Unit 10110203.
Owner: North Dakota State Water Commission.
AQUIFER.--Hell Creek-Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 475 ft, cased to 441 ft, steel pipe, No. 12 slot screen set 441 to 459 ft below land-surface datum.
INSTRUMENTATION.--Measured annually, during late November or early December, using a steel tape.
DATUM.--Altitude of land-surface datum is 3,010 ft. Measuring point: Top of casing 3.40 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 270.15 ft below land-surface datum, Feb. 25, 1973; lowest measured, 272.60 ft below land-surface datum, Nov. 15, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL
NOV 15	272.60

BURLEIGH COUNTY

464943100305801. Local number, 139-078-27CBB.
LOCATION.--Lat 46°49'43", long 100°30'58", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--McKenzie.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 255 ft, cased to 200 ft, plastic pipe, slotted 200 to 220 ft below land-surface datum, gravel packed.
INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.
DATUM.--Altitude of land-surface datum is 1,713. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--August 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.73 ft below land-surface datum, June 5, 1987; lowest measured, 32.44 ft below land-surface datum, Aug. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	25.28	MAR 27	24.57	JUNE 24	24.58	AUG 31	29.27
DEC 3	24.97	APR 30	24.44	JULY 26	24.55	SEPT 30	26.08
DEC 19	24.93	MAY 31	24.60	AUG 15	27.15		

DIVIDE COUNTY

485649103155701. Local number, 163-097-15BCC.
LOCATION.--Lat 48°56'49", long 103°15'57", Hydrologic Unit 09010001.
Owner: North Dakota State Water Commission.
AQUIFER.--Yellowstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 575 ft, cased to 546 ft, steel pipe, No. 12 slot screen set 546 to 558 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,915 ft. Measuring point: Top of casing 1.50 ft above land-surface datum.
PERIOD OF RECORD.--January 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.31 ft below land-surface datum, June 5, 1979; lowest measured, 15.14 ft below land-surface datum, Nov. 29, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 29	15.14	FEB 13	15.07	MAY 2	15.06	AUG 7	15.06

DUNN COUNTY

471323102290101. Local number, 143-093-09BCB.
LOCATION.--Lat 47°13'23", long 102°29'01", Hydrologic Unit 10130201.
Owner: North Dakota State Water Commission.
AQUIFER.--Sentinel Butte.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 965 ft, cased to 378 ft, steel pipe, No. 12 slot screen set 378 to 396 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,133 ft. Measuring point: Top of casing 2.10 ft above land-surface datum.
PERIOD OF RECORD.--February 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.12 ft below land-surface datum, June 7, 1984; lowest measured, 93.79 ft below land-surface datum, June 22, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	93.57	FEB 16	92.40	MAY 7	91.16	AUG 1	93.72

EDDY COUNTY

473720098592401. Local number, 148-065-19DAA.
LOCATION.--Lat 47°37'20", long 098°59'24", Hydrologic Unit 10160001.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 242 ft, cased to 220 ft, plastic pipe, slotted from 210 to 220 ft below land-surface datum.
INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.
DATUM.--Altitude of land-surface datum is 1,526 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--September 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.40 ft below land-surface datum, Sept. 6, 1983; lowest measured, 50.49 ft below land-surface datum, Sept. 6, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 6	46.65	MAY 21	45.48	JULY 9	45.55	AUG 13	45.59
FEB 22	46.00						

EMMONS COUNTY

463632100171901. Local number, 136-076-07CBC.
LOCATION.--Lat 46°36'32", long 100°17'19", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--Long Lake.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 150 ft, cased to 117 ft, plastic pipe, No. 12 slot screen set at 117 to 123 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,735 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.87 ft above land-surface datum, Apr. 17, 1987; lowest measured, 8.32 ft below land-surface datum, Sept. 1, 1977.
CORRECTION.--Highest water level measured, +0.87 ft above land-surface datum, Apr. 17, 1987, was previously published as below-land surface datum (see EXTREMES FOR PERIOD OF RECORD).

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 5	6.85	APR 12	6.92	AUG 16	8.30

GRAND FORKS COUNTY

474957097343501. Local number, 150-054-04CCD.
LOCATION.--Lat 47°49'57", long 097°34'35", Hydrologic Unit 09020307.
Owner: North Dakota State Water Commission.
AQUIFER.--Elk Valley.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 126 ft, cased to 40 ft, plastic pipe, No. 12 slot screen set 40 to 43 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,127 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--September 1963 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.97 ft below land-surface datum, July 23, 1987; lowest measured, 8.04 ft below land-surface datum, Mar. 9, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	7.39	MAY 11	7.32	JUNE 11	6.54	SEPT 4	7.68
MAR 9	8.04						

GRIGGS COUNTY

471612098113101. Local number, 144-059-20CCC.
LOCATION.--Lat 47°16'12", long 098°11'31", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 158 ft, plastic pipe, No. 25 slot screen set 158 to 161 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1975.
DATUM.--Altitude of land-surface datum is 1,430 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 45.84 ft below land-surface datum, Apr. 5, 1977; lowest measured, 90.80 ft below land-surface datum, Aug. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	59.40	DEC 7	52.88	APR 5	49.86	SEPT 26	72.43
OCT 30	59.40	DEC 19	52.43	JULY 25	74.21		

GRIGGS COUNTY

473425098232901. Local number, 147-061-01CCC.
LOCATION.--Lat 47°34'25", long 098°23'29", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 340 ft, cased to 237 ft, plastic pipe, No. 25 slot screen set 237 to 240 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1977.
DATUM.--Altitude of land-surface datum is 1,525 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.17 ft below land-surface datum, Apr. 29, 1987; lowest measured, 96.10 ft below land-surface datum, Aug. 12, 1975.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	37.82	DEC 19	30.22	JULY 26	38.96	SEPT 26	40.32
DEC 7	30.74	APR 6	29.42				

GRIGGS COUNTY

473600098065901. Local number, 148-059-36AAB.
LOCATION.--Lat 47°36'00", long 098°06'59", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--McVille.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 137 ft, plastic pipe, No. 12 slot screen set 137 to 143 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1984.
DATUM.--Altitude of land-surface datum is 1,320 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--October 1971 to December 1982, April 1985 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.77 ft above land-surface datum, Sept. 11, 1986; lowest measured, 12.09 ft below land-surface datum, Aug. 9, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	11.11	APR 6	11.14	JULY 26	10.70	SEPT 26	11.42
DEC 19	11.14						

HETTINGER COUNTY

463153102521001. Local number, 135-097-04DCA.
LOCATION.--Lat 46°31'53", long 102°52'10", Hydrologic Unit 10130204.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,790 ft, cased to 1,320 ft, steel pipe, open hole.
INSTRUMENTATION.--Measured quarterly using a steel tape. Water-level recorder prior to May 1974.
DATUM.--Altitude of land-surface datum is 2,567 ft. Measuring point: Top of casing 0.70 ft above land-surface datum.
PERIOD OF RECORD.--September 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 142.02 ft below land-surface datum, Dec. 19, 1968; lowest measured, 145.91 ft below land-surface datum, Sept. 19, 1968 (first measurement on well may be as much as 1.5 ft low due to slow recovery of well).

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 27	144.42	MAR 6	144.45	MAY 22	144.45	AUG 30	144.46

KIDDER COUNTY

470638099324301. Local number, 142-070-16DDD.
LOCATION.--Lat 47°06'38", long 099°32'43", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--Long Lake.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 84 ft, cased to 70 ft, plastic pipe, No. 18 slot screen set 70 to 73 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1979.
DATUM.--Altitude of land-surface datum is 1,810 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--November 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.94 ft below land-surface datum, Dec. 4, 1976; lowest measured, 26.03 ft below land-surface datum, Aug. 27, 1982.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	22.02	MAR 10	22.07	MAY 7	21.99	JULY 5	22.27
NOV 25	21.97	APR 9	22.00	JUNE 9	22.03	AUG 8	22.70

MC LEAN COUNTY

473752101055301. Local number, 148-082-23BBB.
LOCATION.--Lat 47°37'52", long 101°05'53", Hydrologic Unit 10130101.
Owner: North Dakota State Water Commission.
AQUIFER.--Lake Nettie.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 198 ft, plastic pipe, No. 24 slot screen set 198 to 204 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since December 1984.
DATUM.--Altitude of land-surface datum is 1,880 ft. Measuring point: Top of casing 2.30 ft above land-surface datum.
PERIOD OF RECORD.--December 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.21 ft below land-surface datum, July 31, 1987, and June 27, 1984; lowest measured, 42.30 ft below land-surface datum, Dec. 2, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	39.90	APR 2	40.41	JULY 2	39.99	AUG 28	40.32
NOV 3	39.93	MAY 10	40.10	JULY 3	39.99	SEPT 28	40.55
DEC 15	40.13	JUNE 8	40.01	AUG 3	40.18		

OLIVER COUNTY

470642101162701. Local number, 142-084-24BBA.
LOCATION.--Lat 47°06'42", long 101°16'27", Hydrologic Unit 10130101.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,295 ft, cased to 966 ft, steel pipe, open ended.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,006 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--January 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 197.04 ft below land-surface datum, Dec. 8, 1972; lowest measured, 200.02 ft below land-surface datum, May 7, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	198.27	MAR 6	199.65	JUNE 26	199.58	SEPT 24	199.50

PEMBINA COUNTY

485239097501702. Local number, 162-056-01CCC2.
LOCATION.--Lat 48°52'39", long 097°50'17", Hydrologic Unit 09020313.
Owner: North Dakota State Water Commission.
AQUIFER.--Icelandic.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 40 ft, cased to 37 ft, plastic pipe, No. 12 slot screen set 37 to 40 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 988 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.65 ft below land-surface datum, May 21, 1970; lowest measured, 9.47 ft below land-surface datum, Oct. 14, 1988, and Aug. 22, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	8.72	MAR 6	9.25	JUNE 14	7.69	SEPT 6	9.09

PIERCE COUNTY

475323100092101. Local number, 151-074-20AAA.
LOCATION.--Lat 47°53'23", long 100°09'21", Hydrologic Unit 09020202.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 320 ft, cased to 256 ft, plastic pipe, No. 18 slot screen set 256 to 259 ft below land-surface datum.
INSTRUMENTATION.-- Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,605 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.08 ft below land-surface datum, Nov. 29, 1976; lowest measured, 35.48 ft below land-surface datum, August 24, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	35.15	MAR 6	35.08	MAY 23	34.87	AUG 24	35.48

RICHLAND COUNTY

462633097163402. Local number, 134-052-06CCD2.
LOCATION.--Lat 46°26'33", long 097°16'34", Hydrologic Unit 09020204.
Owner: North Dakota State Water Commission.
AQUIFER.--Sheyenne Delta.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 40 ft, cased to 30 ft, plastic pipe, slotted 30 to 40 ft below land-surface datum.
INSTRUMENTATION.--Water level recorder October 1965 to current year. Prior to February 1972 only 5-day low and EOM water levels are available.
DATUM.--Altitude of land-surface datum is 1,067 ft. Measuring point: Top of casing 0.65 ft above land-surface datum.
REMARKS.--Key well reported in monthly Water Resources Review.
PERIOD OF RECORD.--September 1963 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level, 0.78 ft below land-surface datum, May 13, 1972; lowest recorded, 9.12 ft below land-surface datum, Mar. 8-11, 1989.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MAXIMUM VALUES (DAILY-LOW WATER-LEVEL)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.33	8.39	8.44	8.64	8.71	8.88	8.37	7.62	7.46	7.72	8.39	8.71
10	8.34	8.41	8.47	8.63	8.75	8.83	8.29	7.61	7.47	7.88	8.49	8.62
15	8.38	8.42	8.49	8.62	8.77	8.73	8.20	7.63	7.55	7.95	8.55	8.72
20	8.36	8.43	8.55	8.60	8.83	8.65	8.11	7.66	7.53	8.06	8.57	8.71
25	8.38	8.41	8.62	8.62	8.87	8.55	7.96	7.69	7.60	8.14	8.63	8.74
EOM	8.40	8.43	8.63	8.65	8.88	8.46	7.76	7.77	7.57	8.27	8.68	8.74
MAX	8.40	8.44	8.63	8.65	8.89	8.88	8.45	7.77	7.78	8.27	8.68	8.75

WATER YEAR 1990 HIGHEST WATER LEVEL 7.43 JUNE 7-8 LOWEST WATER LEVEL 8.89 FEB 27

STARK COUNTY

465755102410701. Local number, 140-095-08AAA.
LOCATION.--Lat 46°57'55", long 102°41'07", Hydrologic Unit 10130204.
Owner: North Dakota State Water Commission.
AQUIFER.--Sentinel Butte.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 160 ft, cased to 80 ft, plastic pipe, open ended.
INSTRUMENTATION.--Measured monthly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,419 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.
REMARKS.--Key well reported in monthly Water Resources Review.
PERIOD OF RECORD.--December 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.61 ft below land-surface datum, June 19, 1970; lowest measured, 20.89 ft below land-surface datum, Sept. 21, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	19.79	JAN 22	20.19	APR 23	20.01	JULY 23	20.37
NOV 22	19.82	FEB 22	20.04	MAY 24	20.14	AUG 23	20.62
DEC 22	19.87	MAR 22	20.13	JUNE 22	20.19	SEPT 21	20.89

STEELE COUNTY

471601097371001. Local number, 144-055-26BBB.
LOCATION.--Lat 47°16'01", long 097°37'10", Hydrologic Unit 09020109.
Owner: North Dakota State Water Commission.
AQUIFER.--Galesburg.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 53 ft, plastic pipe, slotted 53 to 68 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.
DATUM.--Altitude of land-surface datum is 1,160 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.43 ft below land-surface datum, June 27, 1970; lowest measured, 25.32 ft below land-surface datum, Aug. 5, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	22.48	NOV 26	22.05	JUNE 5	21.93	AUG 4	24.06
OCT 28	22.28	APR 10	22.33	JULY 6	21.28	SEPT 3	23.64
NOV 24	21.67	MAY 7	21.99				

STUTSMAN COUNTY

463846098274101. Local number, 137-062-26DDD.
LOCATION.--Lat 46°38'46", long 098°27'41", Hydrologic Unit 10160003.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 157 ft, plastic pipe, No. 12 slot screen set 157 to 163 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.
DATUM.--Altitude of land-surface datum is 1,455 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--September 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.20 ft below land-surface datum, Sept. 6, 1979; lowest measured, 20.67 ft below land-surface datum, May 28, 1973.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	16.46	DEC 28	16.60	JUNE 4	17.32	AUG 1	17.35
NOV 16	16.69	APR 4	17.14	JULY 5	17.45	AUG 29	17.40
NOV 26	16.69	MAY 10	17.32	JULY 6	17.45	SEPT 25	17.43

TRAILL COUNTY

473228097051501. Local number, 147-051-22BBB.
LOCATION.--Lat 47°32'28", long 097°05'15", Hydrologic Unit 09020301.
Owner: North Dakota State Water Commission.
AQUIFER.--Hillsboro.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 103 ft, cased to 97 ft, plastic pipe, No. 18 slot screen set 97 to 100 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 925 ft. Measuring point: Top of casing 2.40 ft above land-surface datum.
PERIOD OF RECORD.--August 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +1.90 ft above land-surface datum, July 4, 1979; lowest measured, 7.27 ft below land-surface datum, Aug. 17, 1965.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	2.82	MAR 12	3.20	JUNE 8	2.61	SEPT 6	3.41

WALSH COUNTY

481657097473601. Local number, 156-056-36CCC1.
LOCATION.--Lat 48°16'57", long 097°47'36", Hydrologic Unit 09020308.
Owner: North Dakota State Water Commission.
AQUIFER.--Fordville.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 280 ft, cased to 27 ft, plastic pipe, No. 18 slot screen set 27 to 30 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,145 ft. Measuring point: Top of casing 1.85 ft above land-surface datum.
PERIOD OF RECORD.--May 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.98 ft below land-surface datum, June 3, 1987; lowest measured, 6.98 ft below land-surface datum, Mar. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	6.32	MAY 11	5.67	JUNE 18	6.54	SEPT 7	6.58
MAR 14	5.91						

WALSH COUNTY

482408097443201. Local number, 157-055-21DBC.
LOCATION.--Lat 48°24'08", long 097°44'32", Hydrologic Unit 09020301.
Owner: North Dakota State Water Commission.
AQUIFER.--Dakota Formation.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 496 ft, cased to 491 ft, steel pipe, screen set 491 to 496 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 975 ft. Measuring point: Top of casing at land-surface datum.
PERIOD OF RECORD.--May 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 88.84 ft below land-surface datum, Mar. 9, 1982; lowest measured, 92.75 ft below land-surface datum, Sept. 17, 1974.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	91.83	MAY 10	91.71	JULY 30	91.67	AUG 29	91.44
MAR 14	91.76						

WALSH COUNTY

482449098095801. Local number, 157-058-18DDD.
LOCATION.--Lat 48°24'49", long 098°09'58", Hydrologic Unit 09020308.
Owner: North Dakota State Water Commission.
AQUIFER.--Pierre Shale.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 140 ft, cased to 80 ft, plastic pipe, slotted screen set 80 to 100 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,580 ft. Measuring point: Top of casing 1.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.89 ft above land-surface datum, Dec. 5, 1972; lowest measured, 9.89 ft below land-surface datum, Nov. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	9.89	MAY 11	9.60	JUNE 18	7.39	SEPT 7	8.81
MAR 14	9.53						

WARD COUNTY

480912101090301. Local number, 154-082-24ABA.
LOCATION.--Lat 48°09'12", long 101°09'03", Hydrologic Unit 09010001.
Owner: North Dakota State Water Commission.
AQUIFER.--Lower Souris.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 115 ft, cased to 10 ft, plastic pipe, slotted screen set 10 to 40 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,850 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.84 ft below land-surface datum, June 17, 1965; lowest measured, 16.94 ft below land-surface datum, Sept. 18, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	16.78	DEC 10	16.67	JUNE 26	16.44	SEPT 18	16.94
NOV 30	16.61	MAR 3	16.54				

WELLS COUNTY

474419099371201. Local number, 149-070-09DAA1.
LOCATION.--Lat 47°44'19", long 099°37'12", Hydrologic Unit 10160001.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 283 ft, cased to 177 ft, plastic pipe, slotted 177 to 197 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,610 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--May 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 64.02 ft below land-surface datum, Dec. 10, 1986; lowest measured, 66.65 ft below land-surface datum, Mar. 15, 1967.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 6	64.41	MAR 6	64.78	MAY 22	64.24	AUG 23	65.13

WILLIAMS COUNTY

483048103373101. Local number, 158-100-17ADA.
LOCATION.--Lat 48°30'48", long 103°37'31", Hydrologic Unit 10110102.
Owner: North Dakota State Water Commission.
AQUIFER.--Little Muddy.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 52 ft, cased to 35 ft, plastic pipe, slotted 35 to 43 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,987 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--August 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.02 ft below land-surface datum, June 5, 1979; lowest measured, 24.96 ft below land-surface datum, Aug. 8, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 28	21.29	FEB 13	21.08	MAY 1	20.95	AUG 8	24.96

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)
			BOWMAN COUNTY						
460705103005301	130-099-01BBB	125TRVL	07-26-90	1045	28.18	60.00	2540	8.9	28.0
460645103021801	130-099-03ADD	125TRVL	07-26-90	1510	4.21	64.00	6990	8.1	29.5
460705103025601	130-099-03BAA	125TRVL	07-27-90	1050	21.29	70.00	6380	8.4	27.0
460645103033302	130-099-04ADD2	125TRVL	08-07-90	1500	17.93	50.00	7400	6.8	36.0
460705103041101	130-099-04BAA	125TRVL	08-08-90	1540	13.36	47.00	4400	7.0	33.0
461355103055701	131-099-19DDD	125TRVL	08-06-90	1400	25.59	74.00	2880	8.2	32.0
460902103043601	131-099-21CCB1	125TRVL	08-01-90	1030	58.62	80.00	1800	7.2	31.0
461355103043303	131-099-21CCC3	125TRVL	08-01-90	1430	78.13	152.00	1730	8.7	33.0
460856103024401	131-099-22DCC1	125HRMN	08-07-90	1135	46.15	76.00	3980	7.3	32.0
460856103020701	131-099-23CCC1	125TRVL	08-02-90	1525	77.02	170.00	1500	8.8	38.0
460856103020702	131-099-23CCC2	125TRVL	08-02-90	1135	75.41	100.00	2650	8.5	30.0
460804103010101	131-099-26DDC1	125HRMN	07-30-90	1615	45.73	76.00	1390	8.6	30.0
460843103032001	131-099-27BBC1	120TRTR	07-18-90	1420	53.37	86.00	4800	7.7	28.0
460843103032003	131-099-27BBC3	125TRVL	07-19-90	1015	59.70	160.00	1620	8.8	26.0
460823103030301	131-099-27CAB	125TGRVL	07-19-90	1410	19.28	38.00	4230	6.9	28.0
460816103032701	131-099-27CBC1	125TRVL	07-12-90	1530	46.92	80.00	2780	7.6	26.0
460816103032702	131-099-27CBC2	125HRMN	07-17-90	1435	47.05	60.00	2780	7.3	30.0
460830103044504	131-099-29ADD4	125HRMN	08-03-90	1300	60.02	80.00	1970	8.1	27.0
460849103053201	131-099-29BAB	125TRVL	07-24-90	1705	19.73	33.00	5080	7.5	29.0
460834103055501	131-099-29BCC	125TGRVL	07-25-90	1750	13.14	53.00	1740	9.2	28.0
460823103053201	131-099-29CAB	125TRVL	07-24-90	1415	10.34	30.00	5800	6.9	30.5
460804103052301	131-099-29CDD	125HRMN	07-25-90	1345	14.21	32.00	11000	6.7	28.5
460810103051301	131-099-29DCB	125TRVL	07-25-90	1000	15.05	22.00	5750	6.9	25.0
460751103044501	131-099-32AAD	125TRVL	07-24-90	1015	13.86	23.00	7190	6.6	28.0
460718103045501	131-099-32DDB	125TRVL	08-08-90	1100	12.66	65.00	2910	7.6	30.0
460747103032902	131-099-33ADA2	120TRTR	07-31-90	1200	7.40	38.00	2630	8.3	31.0
460747103032903	131-099-33ADA3	125TRVL	07-31-90	1425	6.35	76.00	2770	8.7	32.0
460757103021601	131-099-34AAA	125TGRVL	07-19-90	1645	22.22	41.00	6390	11.4	28.0
460744103014801	131-099-35BDB1	125TRVL	07-31-90	1730	38.18	78.00	1370	8.9	34.0

STATION NUMBER	DATE	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
460705103005301	07-26-90	9.0	2.3	22	68	11	9.9	560	94	30
460645103021801	07-26-90	9.0	2.5	25	220	20	42	1600	94	47
460705103025601	07-27-90	8.0	2.4	23	160	18	27	1500	95	52
460645103033302	08-07-90	7.5	1.7	16	1800	210	320	1300	60	13
460705103041101	08-08-90	8.5	1.8	17	830	150	110	840	68	13
461355103055701	08-06-90	9.0	2.5	24	81	16	10	600	94	29
460902103043601	08-01-90	8.5	--	--	1000	220	110	62	12	0.9
461355103043303	08-01-90	9.0	3.2	31	34	11	1.7	410	96	30
460856103024401	08-07-90	8.5	1.3	13	1600	290	210	480	39	5
460856103020701	08-02-90	8.5	7.0	67	25	5.4	2.8	330	96	29
460856103020702	08-02-90	8.5	--	--	58	11	7.5	550	95	31
460804103010101	07-30-90	9.0	--	--	16	3.5	1.8	330	97	36
460843103032001	07-18-90	8.5	1.1	11	610	130	70	940	76	17
460843103032003	07-19-90	8.5	6.3	60	17	4.4	1.4	390	98	41
460823103030301	07-19-90	8.0	2.0	19	2400	430	330	390	26	3
460816103032701	07-12-90	10.0	--	--	300	52	42	490	77	12
460816103032702	07-17-90	9.5	--	--	370	61	52	480	73	11
460830103044504	08-03-90	8.5	--	--	160	30	20	410	84	14
460849103053201	07-24-90	8.5	4.5	43	2300	420	310	540	33	5
460834103055501	07-25-90	8.0	0.8	8	18	4.9	1.4	410	98	42
460823103053201	07-24-90	9.0	3.0	29	1300	250	170	1100	64	13
460804103052301	07-25-90	8.5	--	--	2800	340	470	2300	64	19
460810103051301	07-25-90	9.5	1.5	15	1900	320	260	890	50	9
460751103044501	07-24-90	8.5	3.0	29	3500	470	570	940	37	7
460718103045501	08-08-90	8.5	--	--	600	110	78	450	62	8
460747103032902	07-31-90	8.0	--	--	110	21	14	570	91	24
460747103032903	07-31-90	8.0	1.1	10	29	6.0	3.3	630	98	51
460757103021601	07-19-90	8.5	4.1	40	110	24	13	1300	95	53
460744103014801	07-31-90	9.5	0.6	6	23	5.9	2.0	320	96	29

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
				BOWMAN COUNTY						
460705103005301	07-26-90	5.4	690	6.1	--	7.2	1730	1620	2.35	0.030
460645103021801	07-26-90	12	2700	24	--	10	5690	4690	7.74	0.290
460705103025601	07-27-90	12	3200	8.3	--	11	5170	5000	7.03	0.120
460645103033302	08-07-90	12	4500	1.2	--	9.0	6740	6530	9.17	<0.010
460705103041101	08-08-90	15	2200	12	0.10	13	3520	3580	4.79	--
461355103055701	08-06-90	7.1	890	5.8	--	9.3	2010	1870	2.73	0.130
460902103043601	08-01-90	10	810	15	--	5.8	1490	1420	2.03	<0.010
461355103043303	08-01-90	2.5	250	9.0	--	11	1300	1090	1.77	0.340
460856103024401	08-07-90	13	2100	37	0.30	6.7	3700	3440	5.03	--
460856103020701	08-02-90	2.0	76	11	--	11	1080	839	1.47	0.320
460856103020702	08-02-90	5.3	870	4.9	--	7.2	1780	1750	2.42	0.030
460804103010101	07-30-90	2.5	280	5.3	--	7.7	894	892	1.22	0.030
460843103032001	07-18-90	34	1900	28	--	18	3820	3560	5.20	<0.010
460843103032003	07-19-90	2.3	140	22	--	9.2	1170	1010	1.59	<0.010
460823103030301	07-19-90	10	2200	29	--	13	4200	3840	5.71	<0.010
460816103032701	07-12-90	9.1	900	25	--	7.6	1970	1820	2.68	<0.010
460816103032702	07-17-90	9.0	880	25	--	7.8	1980	1830	2.69	<0.010
460830103044504	08-03-90	12	550	7.6	--	8.9	1350	1350	1.84	<0.010
460849103053201	07-24-90	12	3000	25	--	10	5200	4470	7.07	<0.010
460834103055501	07-25-90	2.9	300	7.0	--	9.9	1150	1110	1.56	0.030
460823103053201	07-24-90	22	2500	6.1	--	20	4860	4780	6.61	<0.010
460804103052301	07-25-90	14	6700	120	--	9.1	11600	10400	15.8	<0.010
460810103051301	07-25-90	34	2900	5.6	--	33	5280	4890	7.18	<0.010
460751103044501	07-24-90	16	4600	7.7	--	22	7070	7300	9.62	<0.010
460718103045501	08-08-90	12	1200	2.3	--	10	2230	2110	3.03	<0.010
460747103032902	07-31-90	6.0	820	6.6	--	7.5	1840	1800	2.50	<0.010
460747103032903	07-31-90	3.3	910	7.9	--	8.7	1910	1900	2.60	0.050
460757103021601	07-19-90	35	2700	50	--	2.5	5060	4210	6.88	0.020
460744103014801	07-31-90	2.0	160	11	--	11	1110	873	1.51	0.320

STATION NUMBER	DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	PHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
460705103005301	07-26-90	<0.100	0.500	0.070	--	--	30	--	--	40
460645103021801	07-26-90	0.500	0.320	0.030	--	--	10	--	--	170
460705103025601	07-27-90	0.200	0.360	0.030	--	--	20	--	--	60
460645103033302	08-07-90	<0.100	1.10	0.010	--	--	10000	--	--	3000
460705103041101	08-08-90	--	--	--	4	3600	1300	1	250	640
461355103055701	08-06-90	<0.100	0.540	0.120	--	--	340	--	--	140
460902103043601	08-01-90	<0.100	0.120	<0.010	--	--	50	--	--	240
461355103043303	08-01-90	<0.100	0.650	0.790	--	--	510	--	--	46
460856103024401	08-07-90	--	--	--	5	560	40	1	95	430
460856103020701	08-02-90	<0.100	0.590	0.620	--	--	570	--	--	49
460856103020702	08-02-90	<0.100	0.320	0.150	--	--	60	--	--	20
460804103010101	07-30-90	<0.100	0.220	0.130	--	--	74	--	--	20
460843103032001	07-18-90	<0.100	0.670	0.040	--	--	150	--	--	200
460843103032003	07-19-90	<0.100	0.400	<0.010	--	--	460	--	--	37
460823103030301	07-19-90	<0.100	0.870	<0.010	--	--	410	--	--	3200
460816103032701	07-12-90	<0.100	0.260	0.050	--	--	40	--	--	50
460816103032702	07-17-90	<0.100	0.140	0.020	--	--	30	--	--	70
460830103044504	08-03-90	<0.100	0.520	0.030	--	--	20	--	--	40
460849103053201	07-24-90	0.400	0.070	<0.010	--	--	20	--	--	30
460834103055501	07-25-90	<0.100	0.370	0.270	--	--	110	--	--	10
460823103053201	07-24-90	<0.100	1.10	0.010	--	--	220	--	--	550
460804103052301	07-25-90	<0.100	1.00	0.020	--	--	230	--	--	500
460810103051301	07-25-90	<0.100	0.690	0.010	--	--	130	--	--	480
460751103044501	07-24-90	0.200	0.720	0.290	--	--	200	--	--	3400
460718103045501	08-08-90	<0.100	1.00	<0.010	--	--	70	--	--	220
460747103032902	07-31-90	<0.100	0.180	0.110	--	--	20	--	--	30
460747103032903	07-31-90	<0.100	0.430	0.290	--	--	70	--	--	20
460757103021601	07-19-90	<0.100	0.300	<0.010	--	--	40	--	--	10
460744103014801	07-31-90	<0.100	0.620	0.530	--	--	340	--	--	62

WATER-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	DATE	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, INOR-GANIC, TOTAL (MG/L AS C) (00685)	C-13 / C-12 STABLE ISOTOPE RATIO PER MIL (82081)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	S-34 / S-32 STABLE ISOTOPE RATIO PER MIL (82086)
				BOWMAN COUNTY						
460705103005301	07-26-90	--	--	--	--	32	85	-12.80	--	-12.20
460645103021801	07-26-90	--	--	--	--	9.3	73	-11.50	--	-14.80
460705103025601	07-27-90	--	--	--	--	14	59	-13.10	--	-16.80
460645103033302	08-07-90	--	--	--	--	4.6	75	[a] --	-17.35	[a] --
460705103041101	08-08-90	<1.0	<1	3	4000	--	--	--	--	--
461355103055701	08-06-90	--	--	--	--	40	120	[a] --	--	[a] --
460902103043601	08-01-90	--	--	--	--	2.2	45	-9.80	--	-12.40
461355103043303	08-01-90	--	--	--	--	34	88	[a] --	--	[a] --
460856103024401	08-07-90	<1.0	8	2	4300	--	--	--	--	--
460856103020701	08-02-90	--	--	--	--	46	86	-8.00	--	4.30
460856103020702	08-02-90	--	--	--	--	13	64	-10.30	--	-5.30
460804103010101	07-30-90	--	--	--	--	12	60	-10.00	--	-9.20
460843103032001	07-18-90	--	--	--	--	10	140	[a] --	--	[a] --
460843103032003	07-19-90	--	--	--	--	61	130	[a] --	-17.90	[a] --
460823103030301	07-19-90	--	--	--	--	8.1	150	[a] --	--	[a] --
460816103032701	07-12-90	--	--	--	--	13	96	[a] --	--	[a] --
460816103032702	07-17-90	--	--	--	--	13	110	[a] --	--	[a] --
460830103044504	08-03-90	--	--	--	--	6.6	70	-10.60	--	-9.90
460849103053201	07-24-90	--	--	--	--	6.0	41	-8.40	--	-17.10
460834103055501	07-25-90	--	--	--	--	15	88	-9.70	-17.85	-16.50
460823103053201	07-24-90	--	--	--	--	46	210	-15.70	--	-15.70
460804103052301	07-25-90	--	--	--	--	180	130	-14.40	--	-13.40
460810103051301	07-25-90	--	--	--	--	34	130	-15.60	--	-14.10
460751103044501	07-24-90	--	--	--	--	71	200	-13.00	-14.85	-20.10
460718103045501	08-08-90	--	--	--	--	17	98	[a] --	--	[a] --
460747103032902	07-31-90	--	--	--	--	5.5	66	-12.40	--	-11.30
460747103032903	07-31-90	--	--	--	--	20	73	[a] --	--	[a] --
460757103021601	07-19-90	--	--	--	--	8.6	3.1	--	--	--
460744103014801	07-31-90	--	--	--	--	100	73	[a] --	--	[a] --

a - Results were not available at time of publication. These results will be available, upon request, at a later date.

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 48°47'14", long 97°44'23", in $SW^1/_4NW^1/_4SW^1/_4$ sec. 10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, at Icelandic State Park 5.6 mi west of Cavalier.

PERIOD OF RECORD.--October 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics[1] model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort[1] model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 20 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface. A nonrecording National Weather Service rain gage is installed 28 ft south of the composite sample collector as a quality check on weekly composite precipitation volume.

REMARKS.--Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite period is 9:00 a.m. Analyses are determined from water taken from the sample collector.

COOPERATION.--Onsite observers are provided by the North Dakota State Parks and Recreation Department.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
09/26 to 10/03	<0.01	--	--	a36	--	a7.1	a2.973
10/03 to 10/10	0.13	115	15	--	5.3	--	0.794
10/10 to 10/17	<0.01	--	--	a57	--	a6.9	a1.843
10/17 to 10/24	0.0	--	--	a2	--	a6.0	a0.032
10/24 to 10/31	0.05	40	--	a79	--	a7.5	a1.434
10/31 to 11/07	0.37	78	8	--	4.9	--	0.046
11/07 to 11/14	0.12	83	14	--	5.3	--	0.457
11/14 to 11/21	0.08	25	--	6	--	6.5	0.112
11/21 to 11/28	0.15	53	4	--	5.3	--	0.063
11/28 to 12/05	--	--	13	--	5.6	--	1.807
12/05 to 12/12	b0.0	<50	--	--	--	--	--
12/12 to 12/19	b0.02	<50	--	--	--	--	--
12/19 to 12/26	b--	--	--	--	--	--	--
12/26 to 01/02	--	--	--	a8	--	a6.4	a<0.059
01/02 to 01/09	--	--	--	a17	--	a6.7	a0.240
01/09 to 01/16	0.02	50	--	a7	--	a6.3	a0.154
01/16 to 01/23	0.16	31	5	--	5.4	--	0.098
01/23 to 01/30	0.15	33	5	--	5.7	--	0.140
01/30 to 02/06	b0.0	--	--	--	--	--	--
02/06 to 02/13	b0.0	--	--	--	--	--	--
02/13 to 02/20	b0.11	>9.0	--	--	--	--	--
02/20 to 02/27	0.34	65	5	--	5.3	--	0.107
02/27 to 03/06	b0.0	--	--	--	--	--	--
03/06 to 03/13	0.34	82	6	--	5.6	--	0.053
03/13 to 03/20	1.05	50	6	--	5.3	--	0.139
03/20 to 03/27	0.04	50	--	12	--	6.2	<0.034
03/27 to 04/03	0.25	104	10	--	5.2	--	0.037
04/03 to 04/10	0.11	91	29	--	5.7	--	1.812
04/10 to 04/17	b0.02	<50	--	18	--	6.7	--

1 The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sampler.

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
04/17 to 04/24	0.05	80	--	69	--	7.6	8.19
04/24 to 05/01	0.59	76	17	--	5.4	--	0.590
05/01 to 05/08	0.35	111	18	--	5.2	--	0.545
05/08 to 05/15	0.30	100	14	--	4.9	--	0.217
05/15 to 05/22	0.55	82	9	--	6.2	--	0.050
05/22 to 05/29	b0.01	--	--	--	--	--	--
05/29 to 06/05	2.23	94	8	--	5.8	--	0.250
06/05 to 06/12	0.63	100	4	--	5.7	--	0.073
06/12 to 06/19	0.48	96	11	--	5.6	--	0.368
06/19 to 06/26	0.68	100	7	--	4.6	--	0.112
06/26 to 07/03	0.27	104	13	--	5.0	--	0.409
07/03 to 07/10	0.53	100	12	--	5.9	--	0.205
07/10 to 07/17	0.20	90	16	--	6.0	--	0.989
07/17 to 07/24	0.03	133	12	--	5.8	--	0.835
07/24 to 07/30	0.20	100	--	--	--	--	0.986
07/30 to 08/07	0.77	103	--	8	--	6.5	0.447
08/07 to 08/14	0.45	91	5	--	5.4	--	0.172
08/14 to 08/21	b0.0	--	--	--	--	--	--
08/21 to 08/28	1.82	92	8	--	5.9	--	0.285
08/28 to 09/04	0.0	--	--	a2	--	a5.5	a0.012
09/04 to 09/11	0.29	90	13	10	4.8	6.3	0.607
09/11 to 09/18	0.55	98	12	8	5.4	6.3	0.522
09/18 to 09/25	0.05	60	--	19	--	6.3	0.401

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sampler.

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)
09/26 to 10/03	a0.513	a0.592	a0.199	a3.19	a0.46	a0.540	a0.062
10/03 to 10/10	0.106	0.138	0.115	2.47	0.16	0.610	<0.007
10/10 to 10/17	a0.391	a0.452	a0.556	a5.04	a0.70	a2.03	a<0.058
10/17 to 10/24	a0.007	a0.036	a0.007	a0.04	a0.05	a0.080	a0.030
10/24 to 10/31	a<0.253	a0.590	a<0.253	a<2.53	a2.53	a<1.31	a<0.562
10/31 to 11/07	0.007	0.041	0.008	0.79	0.03	0.220	<0.007
11/07 to 11/14	0.092	0.165	0.076	1.66	0.10	0.510	<0.007
11/14 to 11/21	0.034	0.303	0.027	0.23	0.20	0.240	0.007
11/21 to 11/28	0.019	0.140	0.008	0.18	0.15	0.090	<0.007
11/28 to 12/05	0.269	0.097	0.052	0.80	0.11	0.080	0.010
12/05 to 12/12	--	--	--	--	--	--	--
12/12 to 12/19	--	--	--	--	--	--	--
12/19 to 12/26	--	--	--	--	--	--	--
12/26 to 01/02	a0.020	a0.249	a<0.020	a0.59	a0.39	a0.160	a<0.044
01/02 to 01/09	a0.050	a1.38	a0.542	a1.01	a2.23	a0.260	a<0.037
01/09 to 01/16	a0.022	a0.097	a0.013	a0.53	a0.26	a0.170	a<0.029
01/16 to 01/23	0.026	0.076	0.024	0.35	0.12	0.190	<0.007
01/23 to 01/30	0.021	0.080	0.020	0.39	0.12	0.020	<0.007
01/30 to 02/06	--	--	--	--	--	--	--
02/06 to 02/13	--	--	--	--	--	--	--
02/13 to 02/20	--	--	--	--	--	--	--
02/20 to 02/27	0.020	0.063	0.015	0.45	0.08	0.160	<0.007
02/27 to 03/06	--	--	--	--	--	--	--
03/06 to 03/13	0.006	0.020	0.005	0.37	0.06	0.400	<0.007
03/13 to 03/20	0.019	0.036	0.009	0.52	0.04	0.140	<0.007
03/20 to 03/27	0.011	0.120	0.019	1.31	0.30	0.290	<0.025
03/27 to 04/03	0.012	0.052	0.007	1.35	0.10	0.540	<0.007
04/03 to 04/10	0.425	0.421	0.363	3.56	0.27	1.15	0.007
04/10 to 04/17	--	--	--	--	--	--	--
04/17 to 04/24	1.430	0.557	1.053	4.12	0.28	0.700	<0.007
04/24 to 05/01	0.150	0.066	0.042	0.91	0.12	1.02	<0.007
05/01 to 05/08	0.098	0.582	0.016	2.69	0.08	1.17	<0.007
05/08 to 05/15	0.041	0.062	0.014	1.78	0.09	0.680	<0.007
05/15 to 05/22	0.010	0.019	0.014	0.88	0.08	0.400	<0.007
05/22 to 05/29	--	--	--	--	--	--	--
05/19 to 06/05	0.051	0.024	0.021	0.82	<0.03	0.490	<0.007
06/05 to 06/12	0.012	0.041	0.018	0.35	0.07	0.160	<0.007
06/12 to 06/19	0.092	0.060	0.045	1.28	0.10	0.520	<0.007
06/19 to 06/26	0.024	0.035	0.016	0.76	0.08	0.120	<0.007
06/26 to 07/03	0.068	0.062	0.061	1.21	0.16	0.710	0.010
07/03 to 07/10	0.072	0.060	0.065	1.04	0.18	0.610	<0.007
07/10 to 07/17	0.272	0.041	0.078	1.03	0.10	0.500	<0.007
07/17 to 07/24	0.207	0.114	0.074	1.70	0.33	0.880	<0.007
07/24 to 07/30	0.263	0.046	0.074	1.02	0.17	0.020	<0.007
07/30 to 08/07	0.124	0.031	0.135	0.58	0.09	0.370	<0.007
08/07 to 08/14	0.042	0.015	0.055	0.47	0.05	0.050	<0.007
08/14 to 08/21	--	--	--	--	--	--	--
08/21 to 08/28	0.062	0.027	0.046	0.51	0.07	0.250	<0.007
08/28 to 09/04	a0.004	a0.009	a0.003	a<0.03	a0.07	a0.020	a0.020
09/04 to 09/11	0.152	0.073	0.059	1.29	0.10	0.320	<0.007
09/11 to 09/18	0.095	0.016	0.042	0.93	0.09	0.380	<0.007
09/18 to 09/25	0.098	0.137	0.066	2.73	0.23	1.20	<0.007

a To provide for an adequate sample, 50 milliliters of dilution water was added.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 47°14'32", long 99°14'02", in $SE^1/_4SW^1/_4SW^1/_4$ sec.12, T.142 N., R.68 W., Stutsman County, Hydrologic Unit 10160002, at U.S. Fish and Wildlife Service Northern Prairie Wildlife Research Center, Woodworth Experiment Station, 2.8 mi east and 1 mi south of Woodworth.

PERIOD OF RECORD.--November 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics[1] model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort[1] model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 17 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface. A Belfort[1] model 5-780 rain gage with Omnidata pod recorder is installed 30 ft east of the recording rain gage as a quality check on weekly composite precipitation volume.

REMARKS.--The station is located 300 ft west of an event sample-collection station which was operated by the North Dakota State Health Department (station discontinued 1987). Continuously recording meteorological instrumentation for air temperature, wind speed, and wind direction were installed 9.8 ft above land surface at the event station. Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite periods is 9:00 a.m. Analyses are determined from water taken from the sample collector.

COOPERATION.--Onsite observers are provided by the U.S. Fish and Wildlife Service.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	PRECIPITATION TOTAL INCHES/ WEEK (00046)	COLLECTOR EFFICIENCY WET DEPOS. PERCENT (82284)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
09/26 to 10/03	0.0	--	--	a2	--	a5.6	a0.023
10/03 to 10/10	0.05	80	--	16	--	6.7	0.631
10/10 to 10/17	0.0	--	--	a1	--	a6.0	a<0.009
10/17 to 10/24	0.0	--	--	a2	--	a5.9	a0.065
10/24 to 10/31	0.05	80	--	24	--	6.9	1.841
10/31 to 11/07	0.10	90	12	--	5.3	--	0.221
11/07 to 11/14	b0.01	--	--	59	--	6.6	--
11/14 to 11/21	0.0	--	--	a2	--	a5.8	a<0.009
11/21 to 11/28	--	--	--	23	--	6.9	1.576
11/28 to 12/05	0.0	--	--	a12	--	a6.9	a1.24
12/05 to 12/12	b0.01	--	--	--	--	--	--
12/12 to 12/19	b0.0	--	--	--	--	--	--
12/19 to 12/26	0.0	--	--	a2	--	a5.8	a0.026
12/26 to 01/02	0.0	--	--	a1	--	a6.0	a<0.009
01/02 to 01/09	b<0.01	100	--	18	--	6.9	--
01/09 to 01/16	0.0	--	--	a11	--	a6.8	a1.022
01/16 to 01/23	0.17	100	9	--	4.9	--	0.126
01/23 to 01/30	b0.0	--	--	45	--	6.8	--
01/30 to 02/06	b0.0	--	--	--	--	--	--
02/06 to 02/13	0.0	--	--	a2	--	a6.0	a0.066
02/13 to 02/20	b0.05	>20	--	--	--	--	--
02/20 to 02/27	0.05	60	--	13	--	6.1	0.324
02/27 to 03/06	0.0	--	--	a2	--	a5.8	a<0.009
03/06 to 03/13	--	--	6	--	5.6	--	0.047
03/13 to 03/20	0.20	60	6	--	5.5	--	0.245
03/20 to 03/27	b0.0	--	--	--	--	--	--
03/27 to 04/03	0.08	88	--	14	--	6.4	0.162
04/03 to 04/10	0.03	33	--	a19	--	a6.7	a0.290
04/10 to 04/17	0.05	80	--	7	--	6.5	0.196

1 The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sampler.

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
04/17 to 04/24	0.02	200	--	29	--	6.9	0.826
04/24 to 05/01	0.47	89	15	--	5.3	--	0.387
05/01 to 05/08	0.01	100	--	a41	--	a6.7	a1.228
05/08 to 05/15	0.04	100	12	--	4.7	--	0.595
05/15 to 05/22	0.0	--	14	--	5.7	--	0.178
05/22 to 05/29	--	--	22	--	4.7	--	0.223
05/29 to 06/05	2.22	115	6	--	5.7	--	0.095
06/05 to 06/12	0.45	102	12	--	6.6	--	0.262
06/12 to 06/19	--	--	5	--	6.2	--	0.071
06/19 to 06/26	b<0.01	100	--	a18	--	a6.2	a<0.154
06/26 to 07/03	1.70	69	10	--	5.8	--	0.279
07/03 to 07/10	0.02	150	--	21	--	5.7	0.724
07/10 to 07/17	--	--	9	--	5.6	--	0.235
07/17 to 07/24	b0.02	<50	--	a45	--	a7.3	a0.655
07/24 to 07/31	0.73	4.0	--	702	--	8.0	6.14
07/31 to 08/07	b--	--	--	--	--	--	--
08/07 to 08/14	--	--	21	--	5.5	--	1.611
08/14 to 08/21	0.17	53	18	--	5.9	--	0.427
08/21 to 08/28	0.40	58	19	--	6.3	--	0.367
08/28 to 09/04	0.15	67	18	--	5.4	--	0.693
09/04 to 09/11	0.64	75	8	--	5.5	--	0.219
09/11 to 09/18	--	--	9	--	5.3	--	0.251
09/18 to 09/25	0.12	58	12	--	5.4	--	0.210

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sample.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PERIOD OF COLLECTION	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)
09/26 to 10/03	a0.007	a0.029	a0.013	a<0.030	a0.10	a<0.020	a0.020
10/03 to 10/10	0.122	0.300	0.092	2.080	0.21	0.550	0.023
10/10 to 10/17	a0.003	a0.017	a0.004	a0.030	a0.06	a0.020	a<0.007
10/17 to 10/24	a0.016	a0.039	a0.021	a0.040	a0.07	a0.050	a0.017
10/24 to 10/31	0.250	0.311	0.329	3.670	0.32	0.710	<0.007
10/31 to 11/07	0.052	0.072	0.029	1.240	0.10	0.570	<0.007
11/07 to 11/14	--	--	--	--	--	--	--
11/14 to 11/21	a<0.003	a0.020	a<0.003	a0.040	a0.05	a0.050	a<0.007
11/21 to 11/28	0.408	0.338	0.144	2.260	0.28	0.610	<0.007
11/28 to 12/05	a0.257	a0.088	a0.231	a0.310	a0.06	a0.040	a<0.007
12/05 to 12/12	--	--	--	--	--	--	--
12/12 to 12/19	--	--	--	--	--	--	--
12/19 to 12/26	a0.005	a0.030	a0.006	a<0.030	a0.05	a0.020	a<0.007
12/26 to 01/02	a<0.003	a0.010	a<0.003	a<0.030	a0.04	a0.020	a<0.007
01/02 to 01/09	--	--	--	--	--	--	--
01/09 to 01/16	a0.229	a0.159	a0.233	a0.500	a0.11	a0.140	a<0.007
01/16 to 01/23	0.023	0.037	0.006	0.049	0.09	0.170	<0.007
01/23 to 01/30	--	--	--	--	--	--	--
01/30 to 02/06	--	--	--	--	--	--	--
02/06 to 02/13	a0.017	a0.036	a0.016	a0.040	a0.06	a<0.020	a<0.007
02/13 to 02/20	--	--	--	--	--	--	--
02/20 to 02/27	0.060	0.143	0.041	1.840	0.16	0.750	<0.007
02/27 to 03/06	a<0.003	a0.096	a<0.003	a<0.030	a0.16	a0.290	a<0.013
03/06 to 03/13	0.009	0.030	0.015	0.350	0.06	0.470	<0.007
03/13 to 03/20	0.030	0.051	0.017	0.380	0.10	0.120	<0.007
03/20 to 03/27	--	--	--	--	--	--	--
03/27 to 04/03	0.041	0.080	0.020	2.060	0.15	1.08	<0.007
04/03 to 04/10	a0.066	a0.141	a0.057	a1.890	a0.31	a0.680	a<0.029
04/10 to 04/17	0.048	0.063	0.030	0.430	0.10	0.210	<0.007
04/17 to 04/24	0.098	0.164	0.126	2.860	0.25	2.05	<0.007
04/24 to 05/01	0.082	0.118	0.066	1.230	0.14	1.06	<0.007
05/01 to 05/08	a0.244	a0.361	a0.089	a5.520	a0.60	a2.91	a<0.024
05/08 to 05/15	0.107	0.103	0.044	1.330	0.19	0.740	0.010
05/15 to 05/22	0.033	0.032	0.020	1.810	0.10	0.910	<0.007
05/22 to 05/29	0.060	0.020	0.023	2.940	0.09	0.570	<0.007
05/29 to 06/05	0.023	0.016	0.011	0.550	0.09	0.290	<0.007
06/05 to 06/12	0.040	0.047	0.033	0.980	0.96	0.810	<0.007
06/12 to 06/19	0.013	0.022	0.025	0.510	0.08	0.220	<0.007
06/19 to 06/26	a<0.051	a0.257	a<0.051	a<0.510	a0.86	a0.400	a<0.114
06/26 to 07/03	0.043	0.041	0.045	0.970	0.14	0.560	<0.007
07/03 to 07/10	0.127	0.171	0.125	2.580	0.39	1.20	<0.007
07/10 to 07/17	0.056	0.019	0.046	0.650	0.11	0.410	<0.007
07/17 to 07/24	a0.155	a0.161	a0.411	a1.370	a0.83	a2.49	a<0.040
07/24 to 07/31	2.36	0.835	18	41.9	11	67.5	10.9
07/31 to 08/07	--	--	--	--	--	--	--
08/07 to 08/14	0.414	0.097	0.249	2.380	0.21	0.950	0.023
08/14 to 08/21	0.116	0.064	0.080	1.610	0.14	1.20	<0.007
08/21 to 08/28	0.079	0.429	0.108	1.960	0.15	1.13	<0.007
08/28 to 09/04	0.130	0.103	0.100	2.150	0.18	1.16	<0.007
09/04 to 09/11	0.054	0.026	0.026	1.030	0.12	0.370	<0.007
09/11 to 09/18	0.055	0.214	0.035	0.920	0.07	0.210	<0.007
09/18 to 09/25	0.044	0.116	0.046	1.600	0.11	1.02	<0.007

a To provide for an adequate sample, 50 milliliters of dilution water was added.

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October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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