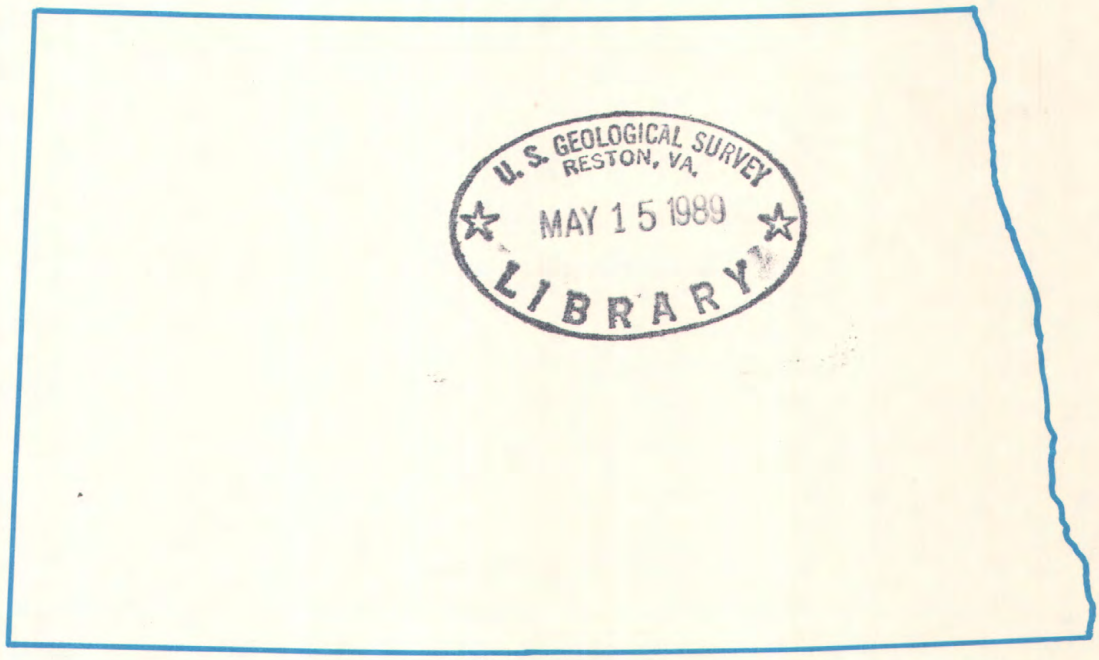
Water Resources Data North Dakota Water Year 1988



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-88-1
Prepared in cooperation with the State of North Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1988

1987

OCTOBER

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1988

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31						

AUGUST

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SEPTEMBER

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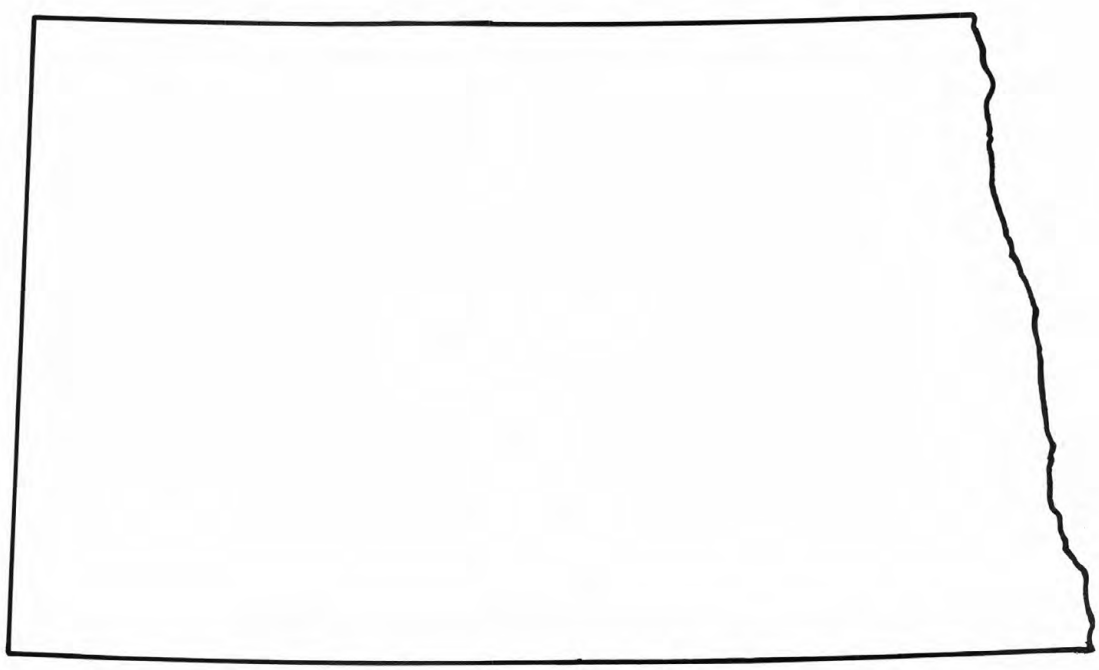
Water Resources Data
North Dakota
Water Year 1988

by R.E. Harkness, N.D. Haffield, G.L. Ryan and E.A. Wesolowski



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-88-1
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
District Chief, Water Resources Division
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821 East Interstate Avenue
Bismarck, North Dakota 58501-1199

1989

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 general supervision of Kenneth L. Lindskov, Acting District Chief, North Dakota.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-89/238	2.	3. Recipient's Accession No.
4. Title and Subtitle Water Resources Data, North Dakota, Water Year 1988			5. Report Date Published May 1989 6.
7. Author(s) R. E. Harkness, N. D. Haffield, G. L. Ryan, and E. A. Wesolowski			8. Performing Organization Rept. No. USGS-WDR-ND-88-1
9. Performing Organization Name and Address U.S. Geological Survey, Water Resources Division 821 East Interstate Avenue 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, 1987, to Sept. 30, 1988 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 1988 water year for North Dakota consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water wells. This report contains discharge records for 105 gaging stations; stage only records for 22 gaging stations; contents and/or stage for 14 lakes and reservoirs; peak flow data for 15 crest-stage gages; water-quality data for 96 gaging stations, 8 lakes, 13 crest-stage gages, 30 wells; and water levels for 31 observation wells. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and local 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, 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	391
	20. Security Class (This Page) Unclassified	22. Price

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[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 LEVELS

QUALITY OF GROUND WATER

QUALITY OF GROUND-WATER--CONTINUED

PRECIPITATION SITES, FOR WHICH CHEMICAL QUALITY DATA ARE PUBLISHED

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 stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in and quality of water from ground-water wells. This volume contains records for water discharge at 105 gaging stations; stage only at 22 gaging stations; contents and/or stage at 14 lakes and reservoirs; water quality at 96 gaging stations, 8 lakes, 13 crest-stage gages, and 30 wells; and water levels in 31 observation wells. Locations of these sites are shown on figures 1, 2, and 3. Also included are data for 15 crest-stage partial-record stations and discharge measurements at miscellaneous sites (25 measurements made at 10 sites by the U.S. Geological Survey and 123 measurements made at 28 sites by the North Dakota State Water Commission). 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-87-1." 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, Vernon Fahy, Chief Engineer; North Dakota Public Service Commission, Dale V. Sandstrom, President; Lower Heart River Water Resources District, R.E. Sylvester, succeeded by W.S. Russell, Chairman; Oliver County Board of Commissioners, Emil Hintz, Chairman; City of Dickinson, A.E. Baumgartner, succeeded by R.B. Baird, Mayor.

Assistance with funds or services was given by the U.S. Army Corps of Engineers for 31 streamflow-gaging stations, 19 river-stage stations, 4 reservoir stations, 3 crest-stage stations, and 35 wells; the U.S. Bureau of Reclamation for 3 streamflow-gaging stations, 2 reservoir stations, water-quality at 11 streamflow stations, and 5 stations on reservoirs; the U.S. Fish and Wildlife Service for 5 streamflow-gaging stations, water-quality at 11 stations, and 1 continuous water-quality monitoring station; the International Joint Commission of the U.S. State Department for 11 streamflow-gaging stations and 1 reservoir; the U.S. Soil Conservation Service for 1 streamflow-gaging station and 1 crest-stage gage; and other U.S. Department of Interior agencies concerned with the Missouri River basin for 6 streamflow-gaging stations, 1 reservoir station, 3 river stage stations, 3 continuous water-quality monitoring stations, and 8 water-quality sampling 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.

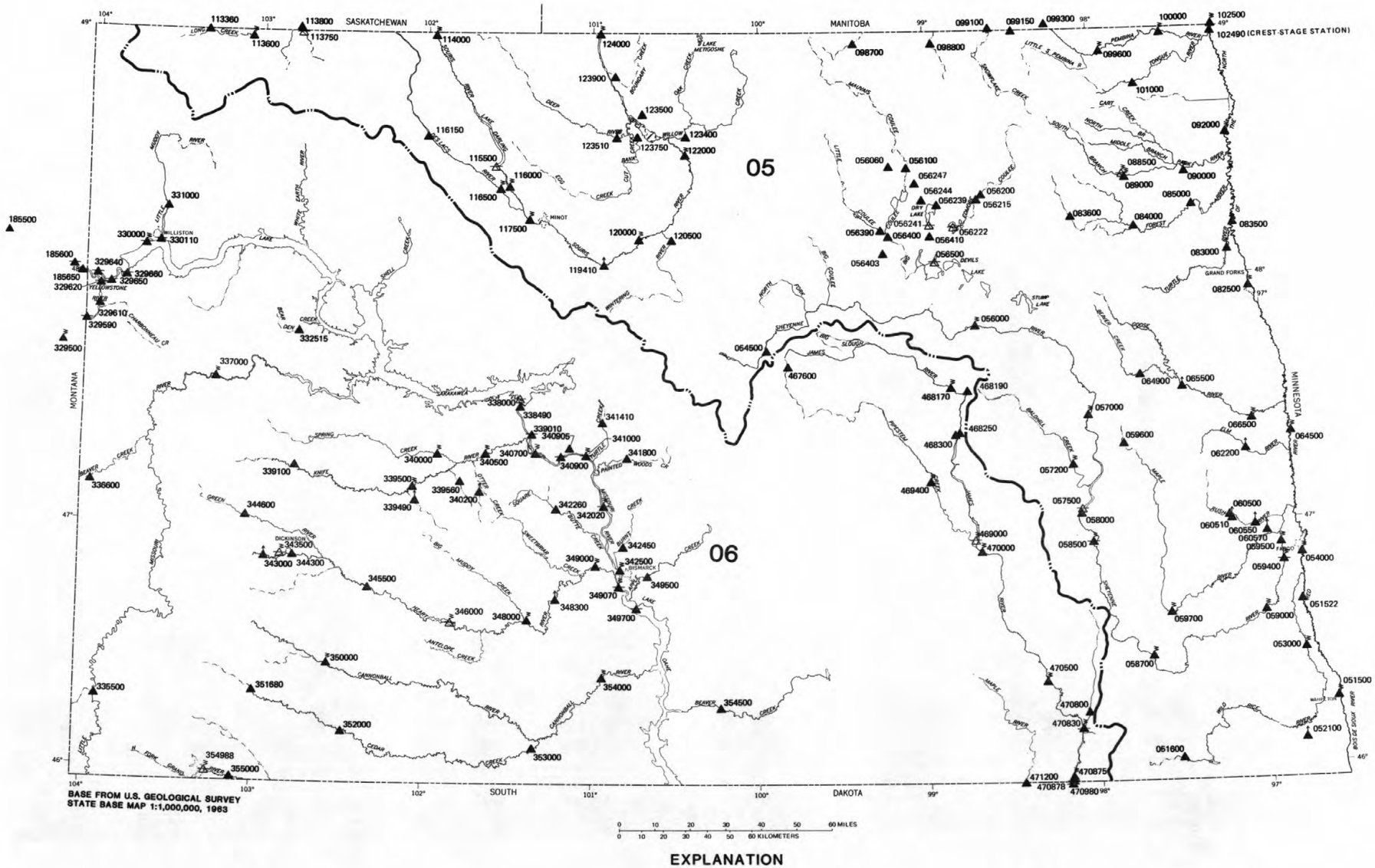

Figure 1.--Location of active surface-water gaging stations.

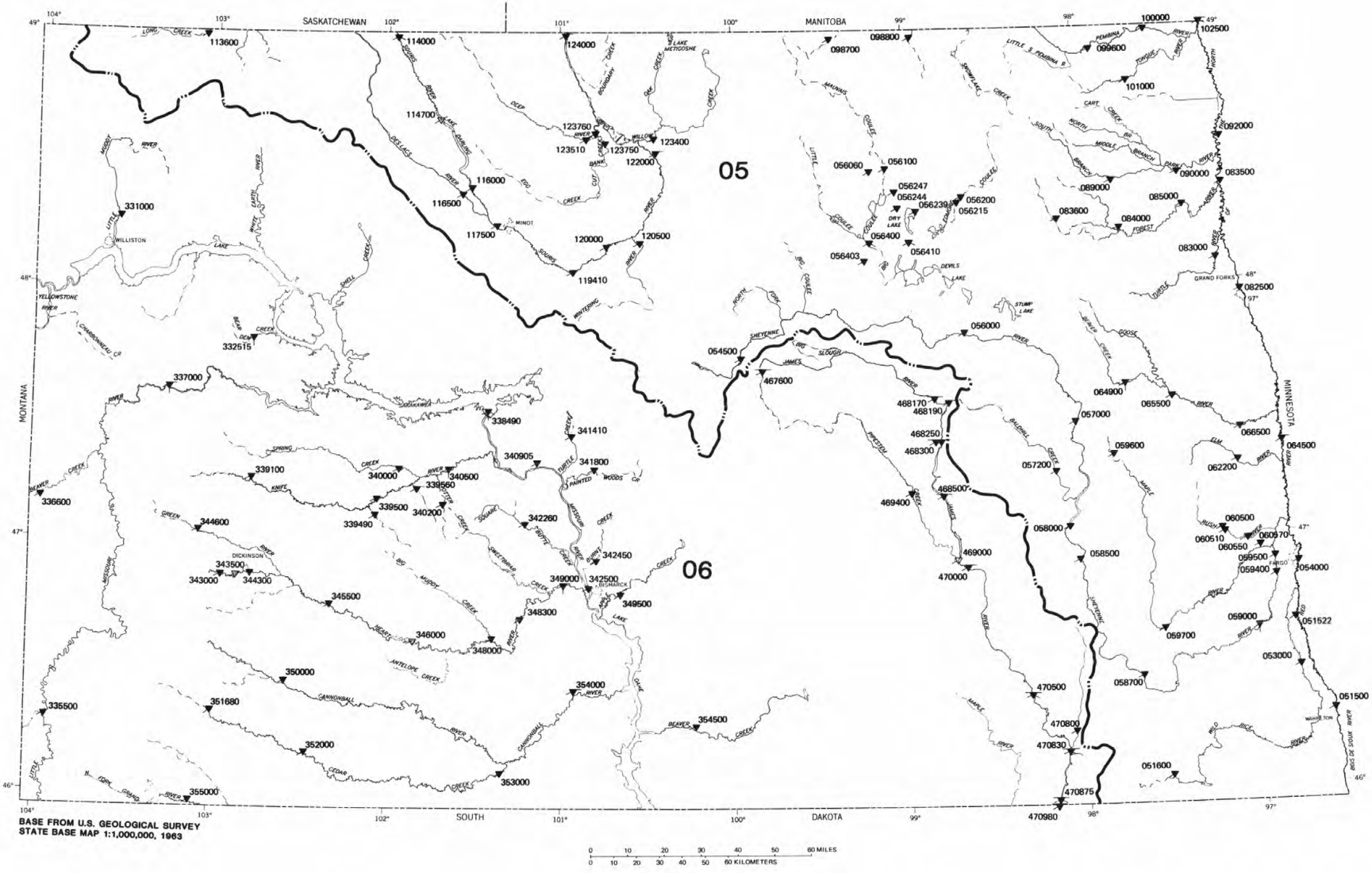

Figure 2.--Location of active surface-water-quality stations.

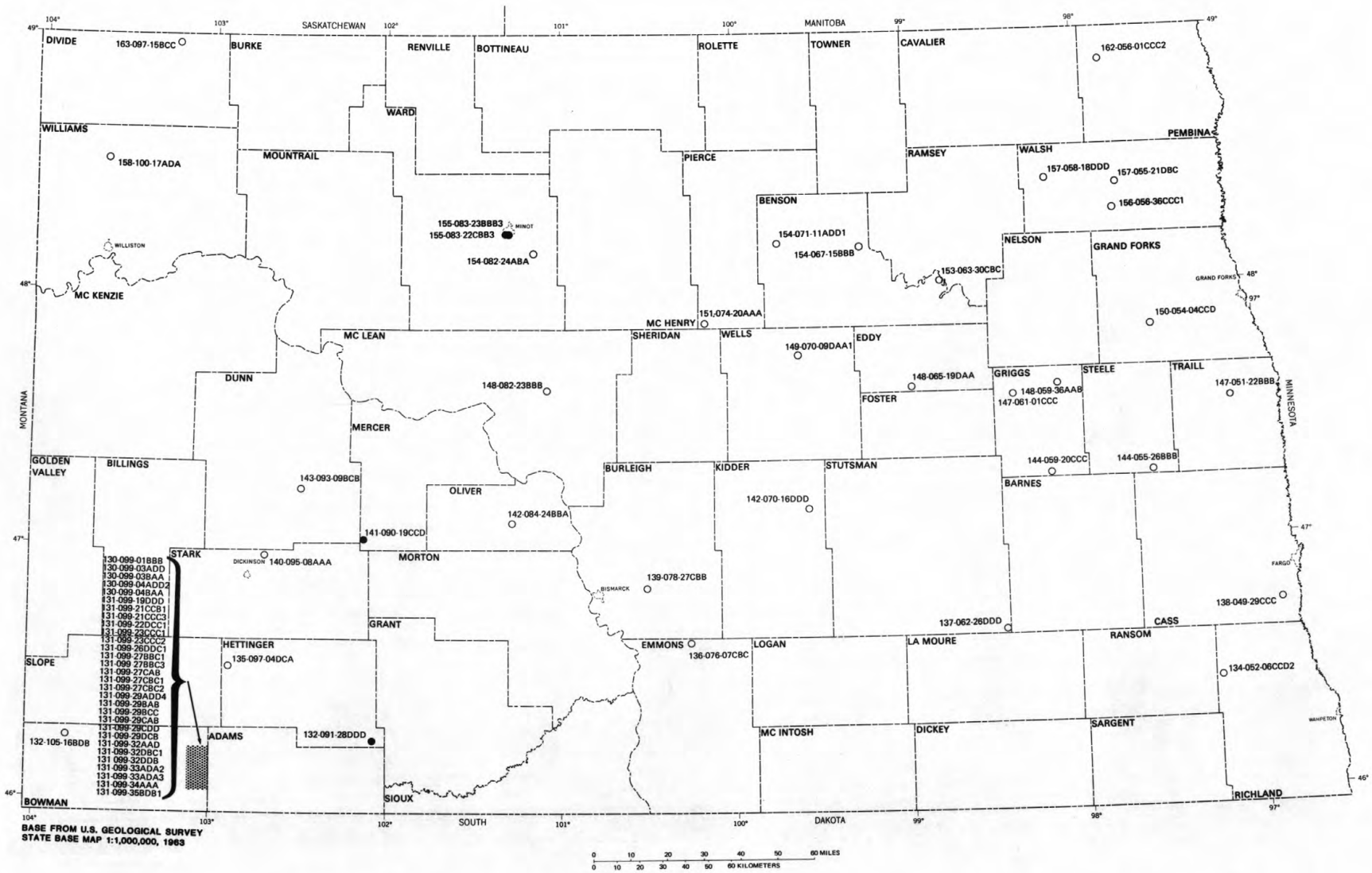

Figure 3.--Location of selected ground-water observation wells.

SUMMARY OF HYDROLOGIC CONDITIONS

Climate

In North Dakota, average 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 generally occurs during April through September. Greatest normal monthly precipitation for the entire State occurs during June. Normal, as related to meteorological data in this report, is an average value of meteorological data for the reference period 1951 through 1980. Precipitation during water year 1988 was about 5 inches less than normal in the northwestern part of the State, about 6 inches less than normal in the eastern one-third of the State, and varied from about 6.5 to 8.5 inches less than normal over the remainder of the State. Meteorological data were obtained from publications of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 1987, 1988, Climatological data, North Dakota: Asheville, North Carolina, v. 96, no. 10-12, v. 97, no. 1-9).

National Weather Service data also indicate that average temperatures across the State were near normal, within about 3 °C (about 5 °F), except for 4 months during the water year. November, December, and April temperatures were about 3 to 6 °C (about 5 to 10 °F) greater than normal. Temperatures during June were about 6 to 8 °C (about 10 to 15 °F) greater than normal. Record high temperatures were recorded at many locations throughout the State on several days during June. According to the National Weather Service (D. E. Stoltz, written commun., July 13, 1988), June 1988 was "the hottest June on record" and "the frequency of 100 °F days set new records at the western stations."

Temperatures during the months of normal spring breakup, March and April, were characterized by above freezing daytime temperatures and below freezing nighttime temperatures. However, during mid-March, there were several days when daytime temperatures did not get above freezing and, during April, there were several days when nighttime temperatures did not get below freezing. March temperatures averaged slightly below freezing statewide. April temperatures averaged about 7 °C (about 12 °F) above freezing and were as high as about 27 °C (about 80 °F) at almost all reporting stations by monthend.

A comparison of total monthly precipitation for water year 1988 to average monthly precipitation for 1951-80 is shown in figure 4 for the nine National Weather Service climatological divisions in North Dakota. Precipitation in all nine National Weather Service divisions in North Dakota during the usually dry fall and winter months of October through February generally was less than normal except for January, which had near-normal to greater-than-normal precipitation.

October, which was very dry, had about 20 percent of normal precipitation. Precipitation during November and December also was deficient; it was about 50 percent of normal except in the northeast and east-central divisions where precipitation was near normal during December. Precipitation was near normal during January except in the east-central division where it averaged more than 100 percent of normal. Most of the January precipitation occurred during a mid-month snowstorm when some areas received accumulations of more than a foot of snow. During February, precipitation was well below normal except in the southwest and south-central divisions where precipitation was near normal. March precipitation generally was near normal statewide.

The most extreme shortage of precipitation occurred during April when precipitation averaged less than 10 percent of normal statewide. Numerous National Weather Service stations reported either zero precipitation or only a trace for the entire month. May precipitation continued the below-normal trend. June, which usually has the greatest normal monthly precipitation statewide, averaged only about 50 percent of normal. The precipitation deficiency continued during the remaining 3 months of the water year except when thunderstorms produced adequate rainfall to bring monthly totals to near-normal levels in isolated areas of the State. September precipitation in the southeast division was well above normal and exceeded total precipitation in that division for any other month during the year.

"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 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, Climate Office, July 11, 1988, U.S. drought 1988: A climate assessment, p. 2).

The Palmer drought index on selected dates for the nine National Weather Service divisions in North Dakota is shown in table 1 (M. T. Roletto, written commun., 1989). At the beginning of water year 1988 (see table 1, column 10/3/87), index values indicate that the southeast division was the only area that had drought conditions. However, below-normal precipitation during October through December, as described above, caused all but the east-central division to register drought conditions by the end of the calendar year (see table 1, column 1/1/88). The northwest and southeast divisions had moderate drought conditions, while the remaining divisions had mild drought conditions.

Drought conditions did not change significantly during the first 3 months of 1988 but, following the extreme deficiency of precipitation in April, conditions began to change rapidly. By mid-May (see table 1, column 5/14/88), conditions had changed to where most of the State had moderate to severe drought conditions and the southeast division had an extreme drought condition. The southwest division was the only area that had moist conditions. This was because the southwest division received an almost near-normal monthly precipitation total for May during the first 2 weeks of the month. The moist conditions were very short-lived.

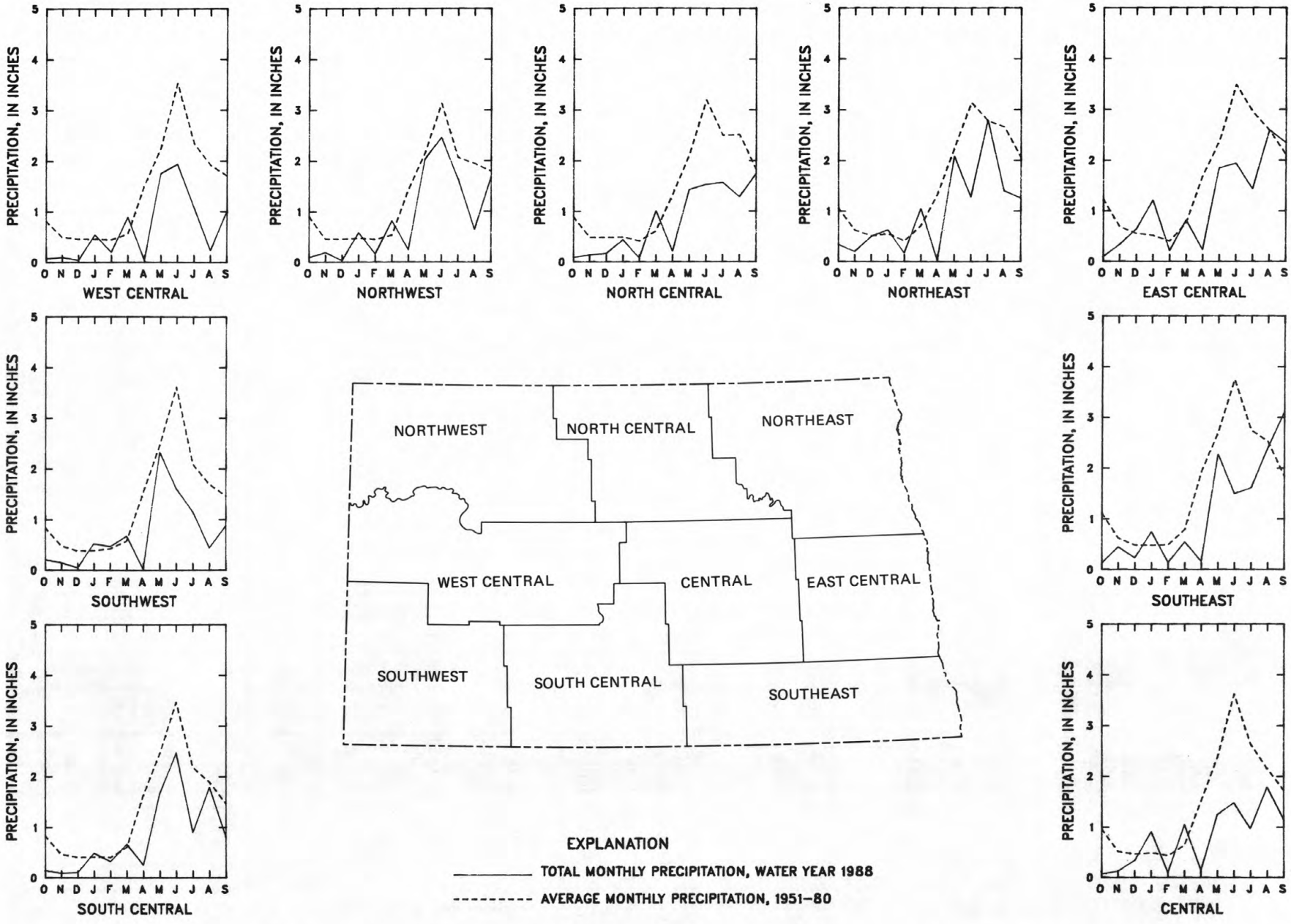

Figure 4.--Comparison, by climatological division, of total monthly precipitation, water year 1988, to average monthly precipitation, 1951-80.

Table 1.--Palmer drought index on selected dates for the nine National Weather Service climatological divisions in North Dakota (M. T. Rolletto, National Weather Weather Service, written commun., 1989)

[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]

National Weather Service climatological division	Palmer drought index by date of computation						
	10/3/87	1/1/88	4/2/88	5/14/88	7/2/88	9/10/88	10/1/88
Northwest	+1.5	-2.7	-2.5	-3.0	-5.6	-7.0	-5.9
North-central	+2.4	-1.6	-1.1	-1.8	-4.2	-6.5	-5.3
Northeast	+2.4	-1.2	+0.3	-2.0	-4.2	-5.4	-5.4
West-central	+1.3	-1.8	-1.7	-2.3	-5.3	-7.5	-6.8
Central	+2.1	-1.4	-1.5	-2.2	-4.5	-6.0	-5.6
East-central	+3.5	+1.9	+1.7	-1.6	-3.8	-5.2	-3.9
Southwest	+2.4	-1.2	-1.1	+0.8	-4.1	-6.5	-6.0
South-central	+3.8	-1.4	-1.4	-2.1	-4.3	-5.8	-5.4
Southeast	-2.3	-2.4	-2.8	-4.1	-6.3	-7.2	-5.5

The extreme heat and below-normal precipitation of June caused extreme drought conditions in most of the State by early July (see table 1, column 7/2/88). The only exception was the east-central division, which had severe drought conditions. Drought conditions continued to worsen until early September (see table 1, column 9/10/88), when the lowest Palmer drought index values for the water year were recorded in seven of the nine divisions. September rains provided some relief from the drought, but the entire State, with the exception of the east-central division, continued to have extreme drought conditions until the end of the water year (see table 1, column 10/1/88). The east-central division had severe drought conditions at the end of the water year.

A joint statement released by J. K. Larson, Research Specialist, and J. W. Enz, State Climatologist, North Dakota State University, Fargo, and D. E. Stoltz, National Weather Service, Bismarck (written commun., August 15, 1988), makes a comparison between the drought of 1988 and the drought of 1936. The following quotation is taken directly from that statement:

> Many questions have been asked about how the 1988 drought compares to the droughts of the 30's. Through June of this year comparisons with 1936 and 1934 showed that temperatures and precipitation in 1988 were more droughty than in the thirties. However temperature records set in July, 1936 may stand forever. For example, the average maximum temperature at Bismarck was 98.1 degrees, nearly 8 degrees warmer than the next warmest July. Hettinger's average maximum temperature was near 100 degrees with 17 days during July equalling or exceeding 100 degrees. Dickinson reached 100 degrees or more on 16 days. The next greatest total was 6 days. North Dakota's record high temperature of 121 degrees was set on July 6, 1936 at Steele.
>
> The number of 90 degree days during April through July, 1988 either broke or tied the record established in 1936 at Crosby, Williston, Pembina, Grand Forks, and Fargo. In southwestern North Dakota the totals in 1919 and 1936 exceeded the number of 90 degree days recorded this year. Most other stations showed 1988 totals ranking just behind 1936.
>
> Precipitation totals for April through July at these same stations indicate slightly drier conditions in 1936 than in 1988. Precipitation totaled 2.86 and 3.53 inches in 1936 and 1988, respectively, at Fargo, and 1.06 and 4.01 inches at Bismarck. These totals ranked as driest and second driest at both stations. Williston fared better in 1988 with 5.52 inches of rain since April 1. This total ranked as the 25th driest period with precipitation totals in 1980, 1983, 1984, and 1985 less than in 1988. Total rainfall in 1980 was 2.89 inches and was the only year that was drier than the 3.08 inches in 1936. The 1980's have been exceedingly dry in northwestern North Dakota.

Streamflow

The greatest mean monthly discharge of North Dakota rivers generally is coincident with snowmelt runoff. Because springtime temperatures usually are higher in the southwestern part of the State than in the northeastern part, snowmelt usually begins on the Missouri River tributaries in western North Dakota and proceeds from west to east across the State. Hydrographs of mean monthly discharge (see fig. 5) for the period of record verify this trend. For example, the largest mean monthly discharge for Bear Den Creek near Mandaree (in the National Weather Service west-central division) occurs in March, whereas the largest mean monthly discharge for the remaining stations occurs in April. Mean monthly discharge for March is almost as large as mean monthly discharge for April at the Cedar Creek near Haynes and the Beaver Creek at Linton stations, further substantiating the general trend of snowmelt occurring from west to east in North Dakota.

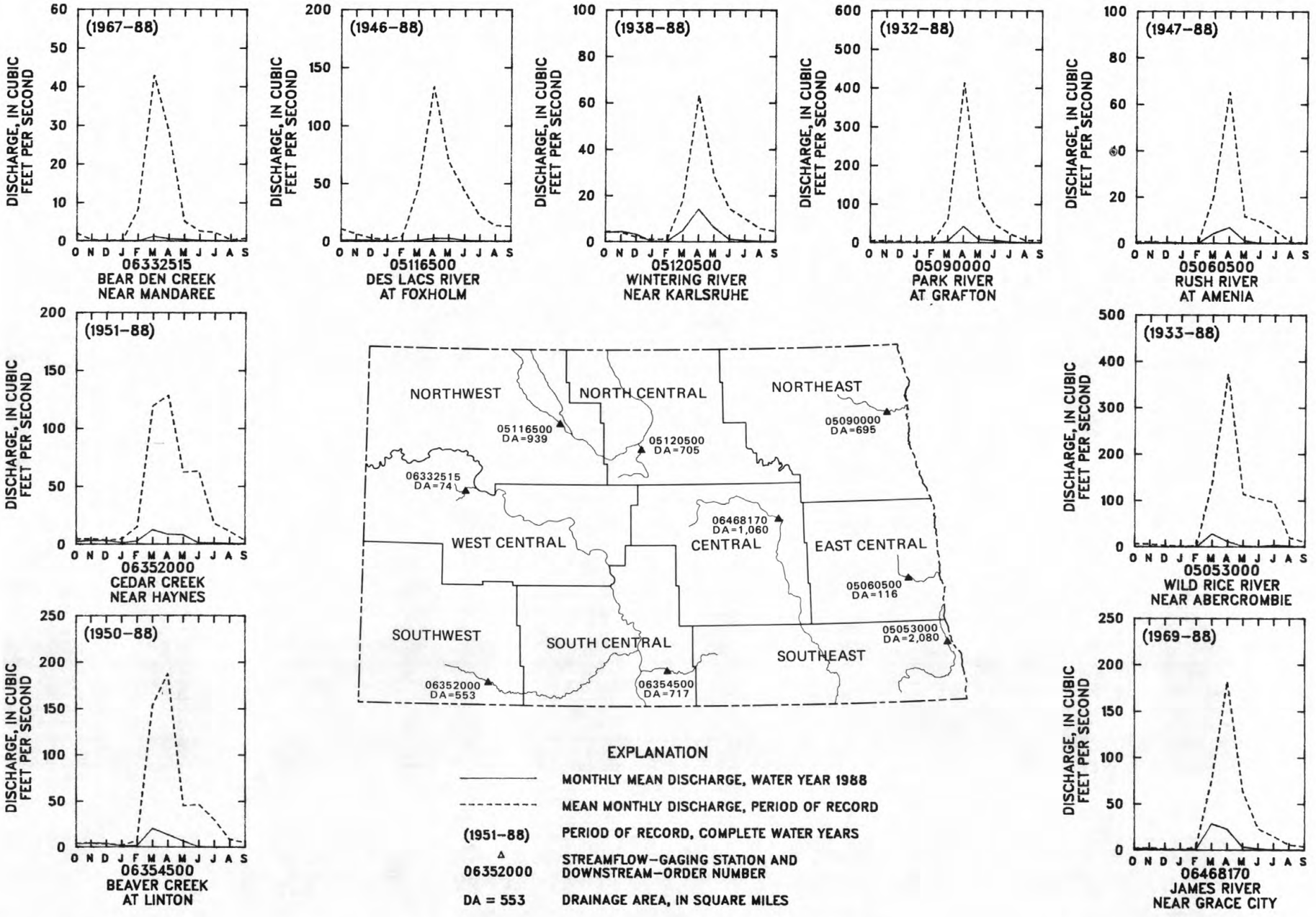

Figure 5.--Comparison of monthly mean discharge during water year 1988 to mean monthly discharge for the period of record.

Although it is possible to make many conclusions about hydrologic conditions of the State by using precipitation data shown in figure 4 and streamflow data shown in figure 5, sound hydrologic judgment should be used. Variability of rainfall intensity and distribution should be considered when making conclusions about hydrologic response to rainfall on small basins. Discrepancies also may be caused by the different reporting periods for the period-of-record average and mean values of data used in the two figures. Precipitation data are 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--22 years, 1967-88, in the case of Bear Den Creek near Mandaree.

Because of the drought conditions described on page 5 and 7, virtually all streams in the State had annual mean discharges well below those expected in normal years. The magnitude of monthly mean discharges for water year 1988 is so much less than the magnitude of mean monthly discharges for the period of record that very little can be inferred from figure 5 other than that the drought resulted in reducing streamflow to a very small percentage of normal.

Streams in the northwest and west-central divisions were especially deficient in streamflow because of below-normal precipitation and above-normal temperatures during water year 1987 as well as during water year 1988. The relative magnitude of monthly mean discharge for Bear Den Creek near Mandaree and for the Des Lacs River at Foxholm (see fig. 5) compared to mean monthly discharges for the period of record shows the effects of the prolonged drought; the monthly mean discharge for both stations is barely evident above the base line of their respective plots.

Selected streamflow statistics for the nine stations shown in figure 5 are summarized in table 2 in order to further substantiate the extreme deficiency in streamflow caused by the drought. Water year 1988 mean and peak discharges are ranked against similar data for each year for the number of years shown. The ranking gives the lowest annual mean discharge for each station and the lowest annual peak discharge for each station a rating of 1. Annual mean discharge for water year 1988 for Bear Den Creek near Mandaree was a new record low for annual mean discharge at that station. Annual mean discharge for water year 1988 for Beaver Creek at Linton was the second lowest on record, as was that for the Des Lacs River at Foxholm. Ranking of water year 1988 peak discharge values yielded three new record low peaks for the nine stations.

Table 2.--Period-of-record mean and median discharges and water year 1988 mean and peak discharges with ranking of water year 1988 data versus lowest annual mean and lowest annual peak discharges for period of record at selected streamflow-gaging stations

	Period of record			Water year 1988			
Station name	Number of years	Mean annual discharge (ft3/s)	Median annual discharge (ft3/s)	Mean discharge (ft3/s)	Ranking of mean from lowest annual mean discharge for period of record	Peak discharge (ft3/s)	Ranking of peak from lowest annual peak discharge for period of record
Beaver Creek at Linton	39	41.3	27.4	4.54	2	44	1
Cedar Creek near Haynes	38	36.6	29.8	3.98	3	28	1
Bear Den Creek near Mandaree	22	7.73	7.92	0.27	1	12	2
Des Lacs River at Foxholm	43	30.4	16.9	0.93	2	4.2	1
Wintering River near Karlsruhe	51	13.1	11.8	3.31	10	64	15
Park River at Grafton	57	57.1	42.8	5.13	7	143	5
Rush River at Amenia	42	9.47	6.23	1.13	4	30	3
Wild Rice River near Abercrombie	56	72.4	35.9	3.99	3	105	6
James River near Grace City	20	31.4	25.9	5.01	3	150	4

Mean discharges for Bear Den Creek near Mandaree and the Des Lacs River at Foxholm were less than 5 percent of their respective mean annual discharges (see table 2). Mean discharge for the Wild Rice River near Abercrombie in the southeast division, the first area of the State to experience extreme drought conditions, was slightly over 5 percent of the mean annual discharge. Discharges for the remaining stations were about 10 to 15 percent of their respective mean annual discharges except for the Wintering River near Karlsruhe station in the central division. Mean discharge for that station was about 25 percent of mean annual discharge, perhaps due to a larger base flow. The Wintering River near Karlsruhe drainage basin received above-normal precipitation during water year 1987.

Chemical Quality of Streamflow

The quality of water at any particular site is dependent upon many factors, including the source of streamflow and the composition of rocks over which it flows; therefore, the quality of water varies considerably across the State. The quality of water also is dependent cnt.1 on the amount of streamflow. During periods of low flow, when the major part of flow is derived from ground-water inflow, dissolved-solids concentrations are relatively large, reflecting the mineralized character of the ground-water inflow. Specific conductance commonly is used as a measure of the relative degree of mineralization or salinity of water and, consequently, often 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 in water used for irrigation. The specific conductance and corresponding salinity hazard are as follows: low hazard, less than 250 microsiemens per centimeter at 25 °C; medium hazard, 250 to 750 microsiemens per centimeter at 25 °C; high hazard, 750 to 2,250 microsiemens per centimeter at 25 °C; very high hazard, 2,250 to 5,000 microsiemens at 25 °C.

Annual maximum values of specific conductance in North Dakota usually are measured during the fall and winter months when streamflow primarily is derived from ground-water inflow. As streamflow increases from increased runoff, the concentration of constituents in solution decreases, while other materials that tend to be carried in suspension, such as sediment, increase. The variability quality of water constituents is greatest during the spring when there is considerable overland runoff from snowmelt. Annual minimum values of specific conductance are measured during the spring runoff period (March and April). The minimum value is dependent on the quantity of runoff available for dilution.

In water year 1988, specific-conductance values during winter and spring generally were larger than long-term mean values (see table 3). The larger-than-normal specific-conductance values during the spring runoff period are directly related to the relatively low flows and drought condition during the year. Specific-conductance values measured for water year 1988 at five selected sites on major rivers and tributaries in the State are shown in table 3. Mean, maximum, and minimum values of specific-conductance are shown by month and for the period of record. At all five sites the mean specific-conductance values for water year 1988 are larger than the mean annual values for the period of record and are larger than annual mean values for water year 1987 (R.E. Harkness, N.D. Haffield, and G.L. Ryan, 1988, Water resources data North Dakota, Water year 1987: U.S. Geological Survey Water-Data Report ND-87-1, 392 p.)

Specific-conductance values measured during October and November 1988 in the Red River of the North at Grand Forks exceeded maximum monthly specific-conductance values for October and November for the period of record and equalled July and August maximum monthly specific-conductance values for the period of record. The Red River of the North is the least mineralized major river in North Dakota. Annual minimum specific-conductance values generally are measured during the spring snowmelt period. Larger specific-conductance values measured during other periods of the year reflect contributions from tributaries that receive inflow from more mineralized ground water and from tributaries that flow through glacial drift containing more soluble minerals than the lacustrine sediments through which the Red River of the North flows. Specific-conductance values measured during water year 1988 indicate that a medium salinity hazard for irrigation use existed throughout the year.

The dissolved-mineral content of Souris River water is derived mostly from leaching of morainal deposits in Saskatchewan, Canada. Specific-conductance values measured during water year 1988 at the Souris River near Sherwood station were well within the range of measured values for the period of record for each month. Levels of salinity hazard for irrigation use were high during water year 1988, even during the snowmelt runoff period, because of the extreme low-flow condition. The Souris River near Sherwood did not flow from December through February and from July through September.

Specific-conductance values generally are lower during snowmelt runoff periods because the snow contains only small amounts of dissolved constituents and has a relatively short contact time with surficial sediments prior to reaching the river channel. Because ground-water contributions to streamflow of the Little Missouri River near Watford City are limited, no-flow conditions exist at times in most years. During water year 1988, no flow was recorded for January and August and for parts of February and September. Specific-conductance values measured in the river during March and June exceeded specific-conductance values for the period of record for those 2 months. The large specific-conductance values during low flow generally reflect the effects of evaporation. Salinity hazard for irrigation use was high during March and July 1988 and high to very high during the remainder of the water year.

Ground-water contributions to the Cannonball River at Breien also are limited. The large specific-conductance values generally reflect the effects of evaporation. Salinity hazard for irrigation use was high during water year 1988 except during December through February and during June when it was very high.

Table 3.--Comparison of specific-conductance measurements during water year 1988 to mean annual specific conductance for period of record

[Specific-conductance values are in microsiemens per centimeter at 25 °Celsius]

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Water year 1988	Period of record
05082500 Red River of the North at Grand Forks (period of record, water years 1949, 1956-88)														
Mean	513	587	604	575	554	483	459	557	545	495	502	485	654	518
Maximum	700	790	976	870	830	746	747	702	699	640	625	674	810	976
Minimum	399	440	468	275	400	305	200	325	348	280	360	340	475	200
Number of values	63	36	44	43	39	71	148	81	70	69	51	43	11	758
Measured values for water year 1988	700	790	--	810	770	--	475 590	665	--	640 580	550 625	--	--	--
05114000 Souris River near Sherwood (period of record, water years 1970, 1972-88)														
Mean	1070	1270	1630	1740	1630	1280	620	784	1020	1030	974	1060	1240	1130
Maximum	1470	1880	2230	2770	2200	2180	1280	1160	1340	1420	1300	1240	1530	2770
Minimum	710	925	1250	1280	540	200	277	345	520	540	128	755	1020	128
Number of values	26	23	14	21	21	28	38	20	24	20	26	16	5	277
Measured values for water year 1988	1140	1310	--	--	--	1530	--	1020	1220	--	--	--	--	--
06337000 Little Missouri River near Watford City (period of record, water years 1972-88)														
Mean	1980	2020	2890	2400	1220	977	1440	1800	1660	1820	1770	1750	2220	1750
Maximum	3100	2610	5000	3350	2030	1760	2700	3100	2780	3000	2520	2390	2780	5000
Minimum	720	740	1730	1500	640	400	515	850	800	1080	1000	900	1760	400
Number of values	16	15	9	8	5	21	18	15	17	14	17	12	6	167
Measured values for water year 1988	2280	2400	--	--	--	1760	2260	--	2780	1840	--	--	--	--
06354000 Cannonball River at Breien (period of record, water years 1950, 1971-88)														
Mean	1630	2170	2570	2410	1910	876	1130	1790	1670	1580	1510	1660	2180	1660
Maximum	2130	3070	3290	3800	4860	3100	2260	2930	3020	3000	2800	2300	4860	4860
Minimum	903	1600	284	680	190	190	300	481	610	570	575	730	1030	190
Number of values	19	18	18	22	23	34	33	20	20	19	19	19	11	264
Measured values for water year 1988	1030	1760	2400	2410	4860 1960	--	1310 1810	2200	2360	1930	--	--	--	--
06470500 James River at La Moure (period of record, water years 1957-88)														
Mean	834	881	1150	1380	1300	643	522	783	807	762	747	870	896	846
Maximum	1130	1220	1550	1700	1720	1350	919	1210	1180	1280	1140	1210	1530	1720
Minimum	480	540	890	340	700	185	160	500	170	170	485	480	580	160
Number of values	29	17	11	26	13	29	38	23	26	18	20	27	9	277
Measured values for water year 1988	580	670	--	1530	1120	640	670	900	1080	--	870	--	--	--

Ground-Water Levels

Water levels measured during water year 1988 for well 134-052-06CCD2 in Richland County are shown in figure 6, and water levels for well 140-095-08AAA 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 all measurements made on these two wells prior to water year 1988 also are shown.

Water-level fluctuations in both wells during water year 1988 (see figs. 6 and 7) appear to follow the typical pattern of rises during the wet spring months and general declines during the rest of the year. However, the lack of precipitation in April apparently resulted in less water-level rise than normally might be expected. The less-than-normal precipitation in conjunction with above-normal temperatures in June apparently resulted in a larger water-level decline in well 140-095-08AAA than normally might be expected. Well 134-052-06CCD2, which was already at a record low monthly water level, continued to decline.

Water-level measurements for well 134-052-06CCD2 were slightly higher during the first 5 months of water year 1988 than the lowest monthly water level for the previous period of record (see fig. 6). Lack of precipitation in April reduced recovery of the water level. Beginning in April and for each subsequent month of the water year, a new record low monthly water level was recorded. The April recovery in well 140-095-08AAA (see fig. 7) also was less than usual although the well had begun the year at a near-normal water level. The less-than-normal recovery in April resulted in a lower measured water level for the month than the mean monthly water level. As the drought continued, the monthly water level began decreasing sooner and at a more rapid rate than the mean monthly water levels, and in September, a new record low water level for September was reached for well 140-095-08AAA.

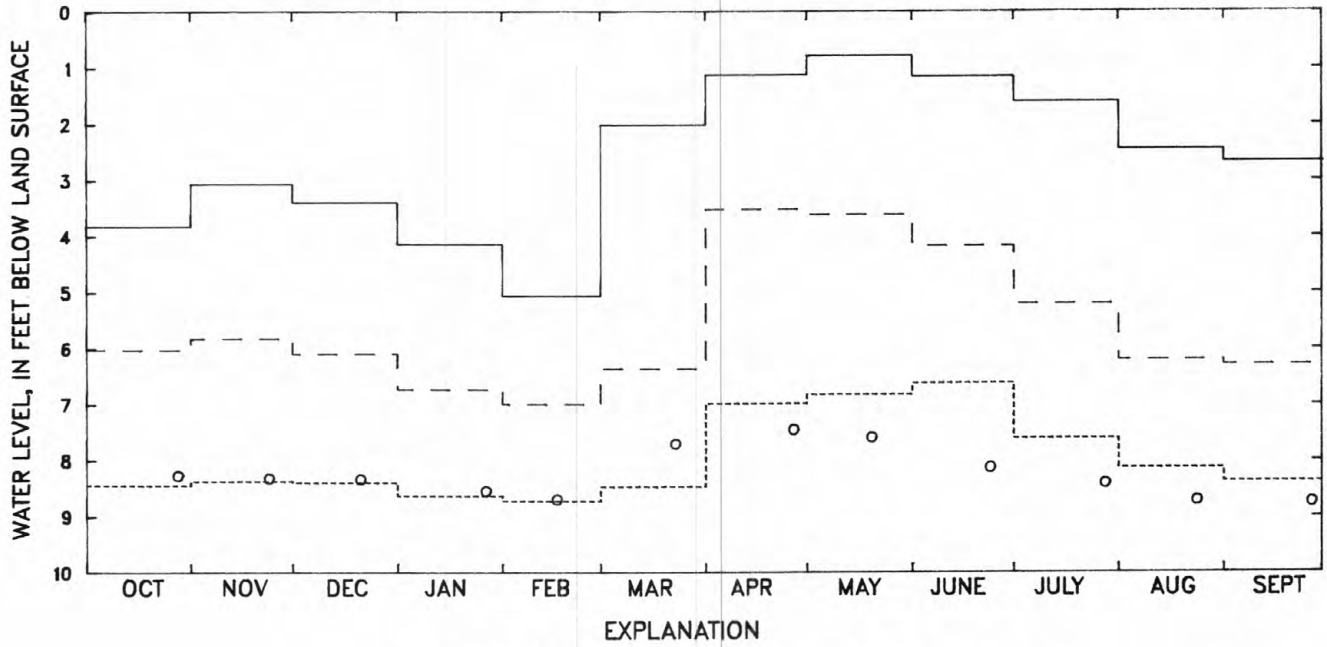

Figure 6.--Water levels in well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, compared with highest monthly water level, mean of monthly water levels, and lowest monthly water level for the period of record. Location of well is shown in figure 3.

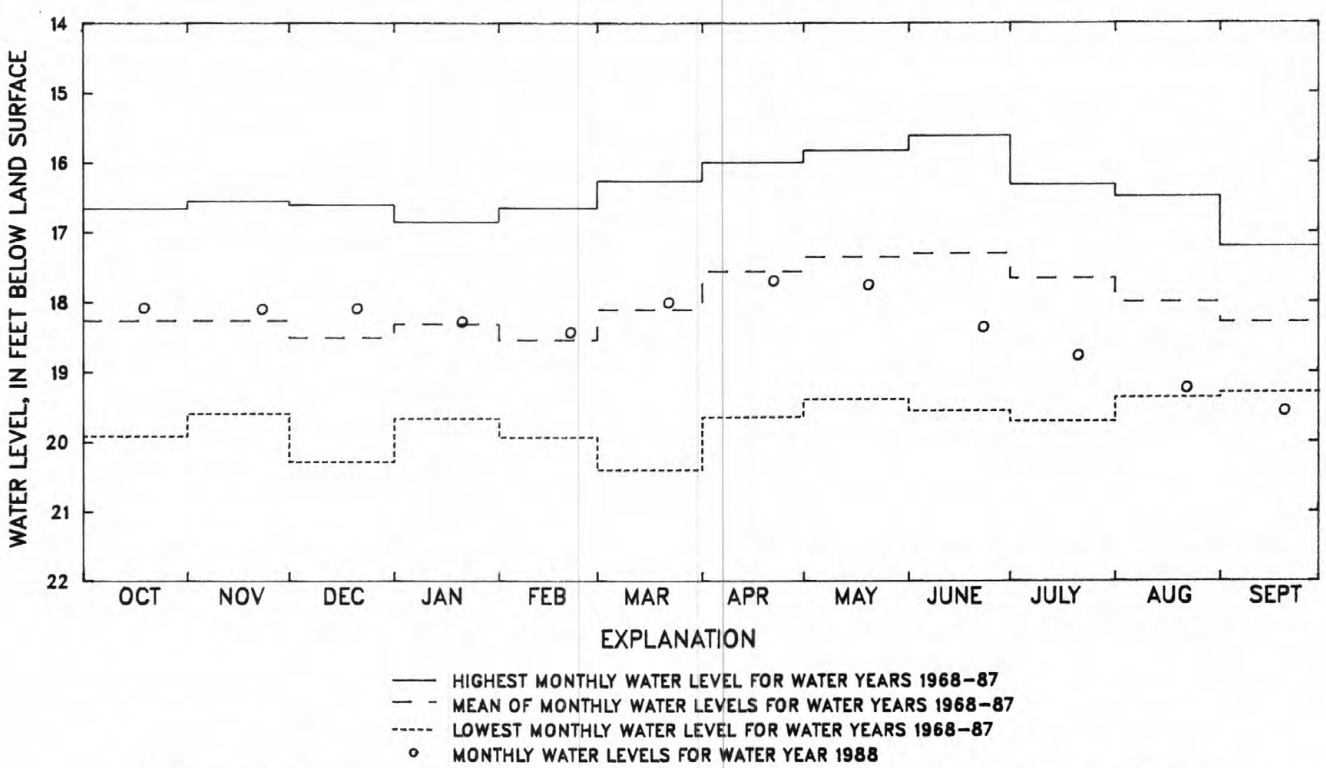

Figure 7.--Water levels in well 140-095-08AAA completed in Sentinel Butte aquifer, Stark County, compared with highest monthly water level, mean of monthly water levels, and lowest monthly water level for the period of record. Location of well is shown in figure 3.

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 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 1988 water year that began October 1, 1987, and ended September 30, 1988. 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 SW¼SE¼NE¼ 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.

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 or with digital recorders that punch stage values on paper tapes at selected time intervals. 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.

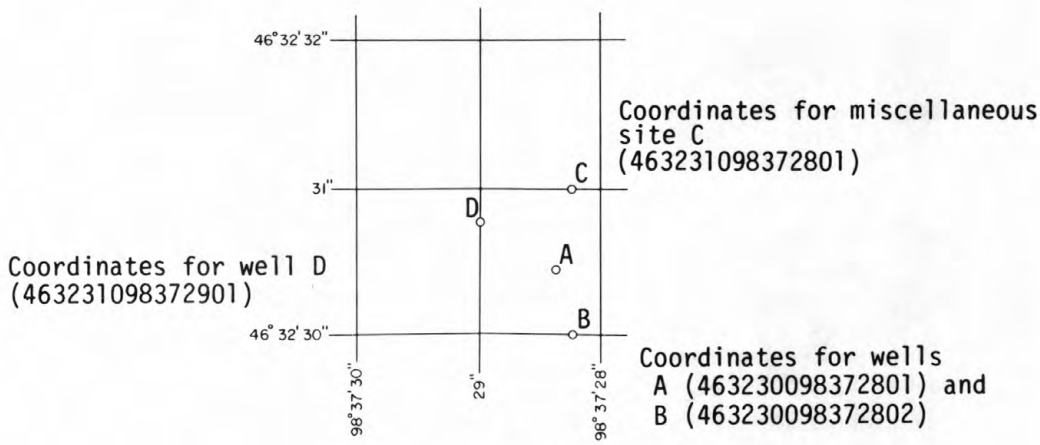

Figure 8.--System for numbering wells and miscellaneous sites (latitude and longitude).

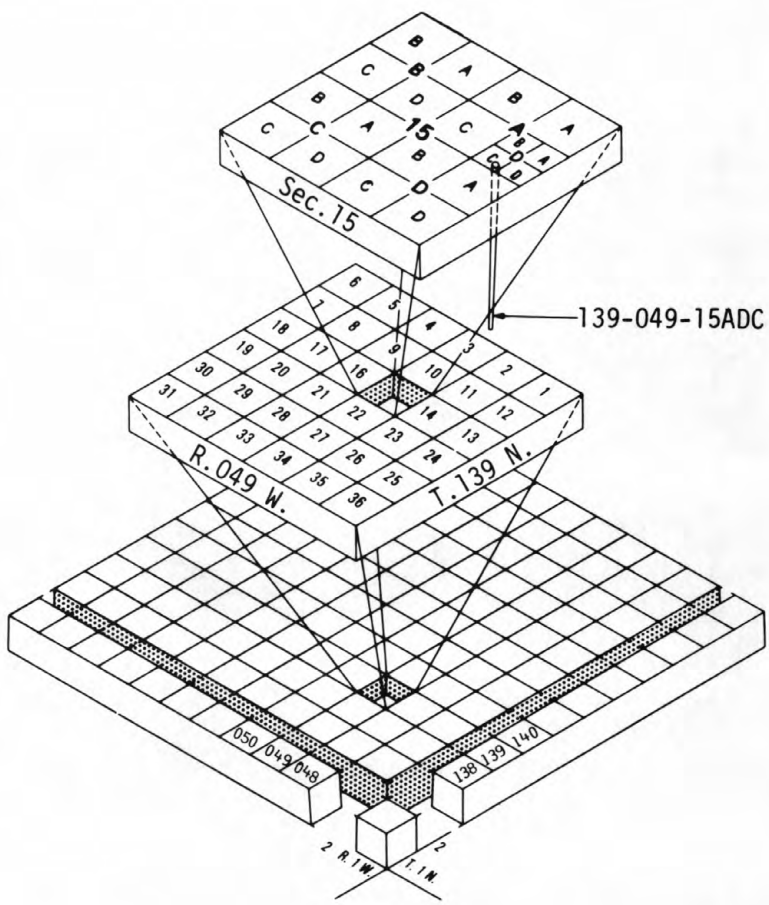

Figure 9.--System for numbering wells and miscellaneous sites (township and range).

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 ao a continuous graph or a series of discrete values punched at short intervals on a paper tape. 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.

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 AREA: 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			

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 3/24/89 AT 1835 SEQ 1.0001

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

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1988 06340500 /USGS

I N P U T D A T A S U M M A R Y

-- 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
55	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. 275.2
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 65223.6

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	3.6270	0.4235	-0.161
W R C ESTIMATE	0.0	1.0000	3.6270	0.4235	-0.222

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	280.7	296.8	235.6	160.0	428.2
0.9900	374.5	391.0	329.3	224.2	552.2
0.9500	803.2	816.1	763.2	543.6	1089.6
0.9000	1189.3	1195.7	1145.4	852.0	1555.3
0.8000	1887.9	1880.9	1853.7	1432.4	2387.1
0.5000	4392.2	4348.7	4392.2	3531.1	5473.4
0.2000	9710.2	9690.2	9863.0	7670.2	12828.1
0.1000	14409.9	14518.2	14852.8	11062.7	19989.0
0.0400	21629.4	22102.2	22706.3	15996.3	31803.1
0.0200	27893.6	28825.9	29939.5	20095.5	42656.6
0.0100	34877.7	36461.3	38135.6	24523.7	55281.2
0.0050	42605.6	45063.3	47875.7	29288.5	69786.7
0.0020	53999.5	58011.4	61458.2	36112.8	92033.1

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

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PGM J407 VER 3.7                          U. S. GEOLOGICAL SURVEY
(REV  11/5/81)                      ANNUAL  PEAK  FLOW  FREQUENCY  ANALYSIS
                                     FOLLOWING WRC GUIDELINES BULL. 17-B.          RUN-DATE  3/24/89 AT 1835   SEQ  1.0001

  STATION -  06340500      /USGS     KNIFE RIVER AT HAZEN, ND                    1930-1988              06340500      /USGS
```

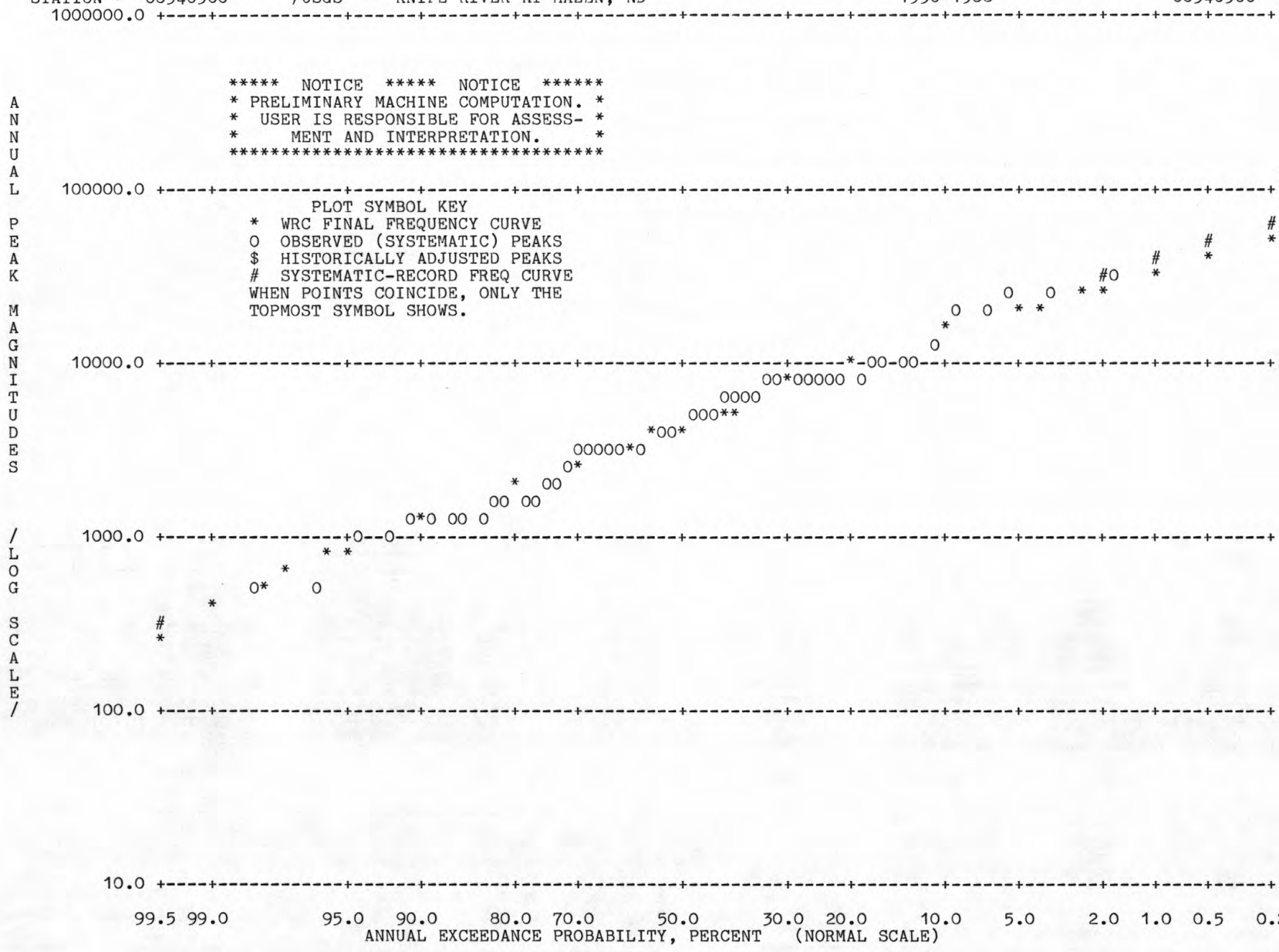

Figure 12.--Example of computer printout for peak flow frequency curve for the Knife River at Hazen.

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 (MEAN,VARIANCE,STANDARD DEVIATION,SKEWNESS,COEFF. OF VARIATION,PERCENTAGE OF AVERAGE VALUE)											
37.49	31.56	21.48	20.32	91.40	723.59	579.33	175.86	252.80	114.61	48.44	35.95
2403.18	851.04	160.82	624.48	24710.98	5 70496.63	744663.25	61729.27	63811.26	22585.73	1823.48	918.41
49.02	29.17	12.68	24.99	157.20	755.31	862.94	248.45	252.61	150.29	42.70	30.31
5.79	5.41	2.32	3.38	3.30	1.56	2.51	3.63	1.46	3.99	1.88	2.03
1.31	0.92	0.59	1.23	1.72	1.04	1.49	1.41	1.00	1.31	0.88	0.84
1.76	1.48	1.01	0.95	4.29	33.93	27.16	8.25	11.85	5.37	2.27	1.69

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			
17.8	19.2	12.6	7.61	9.57	170.0
		FIFTIETH PERCENTILE			
27.9	25.7	19.5	12.8	22.1	418.5
		SEVENTY FIFTH PERCENTILE			
40.6	35.7	28.5	19.5	112.3	1123

APRIL	MAY	JUNE	JULY	AUG	SEPT
		TWENTY FIFTH PERCENTILE			
97.2	56.7	66.7	29.3	17.2	18.5
		FIFTIETH PERCENTILE			
180.7	91.0	160.5	74.1	36.4	27.3
		SEVENTY FIFTH PERCENTILE			
763.8	180.6	341.7	145.1	69.6	45.2

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
DATE PROCESSED: 03-25-1989 @ 14:38 BY REHARKNESS

RATINGS USED --
INPUT 13.0 09/01/79 (0015)
STNRD 16.0 10/01/87 (0015)

06340500

KNIFE RIVER AT HAZEN, ND

OUTPUT PARAMETER 00060 STORE STATISTIC(S) 00003
PROVISIONAL DATA FOR WATER YEAR ENDING SEPT. 30, 1988

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
05/01/88	1.94 51 <2300>	1.88 45 <0015>	1.89	47	-0.10W	0.01	188 188 188 188 188 188 188 188 188 189 189 189 189 189 189 189 190 190 190 191 192 193 194 194
05/02/88	2.33 89 <2400>	1.94 51 <0015>	2.15	71	-0.10W	0.01	195 196 198 199 202 205 206 208 209 211 214 218 221 224 225 225 225 225 225 225 227 228 231 233
05/03/88	2.65 125 <2015>	2.34 90 <0015>	2.51	109	-0.10W	0.01	235 238 240 241 242 243 244 245 246 247 248 249 250 252 255 258 261 262 264 264 265 265 265 265
05/04/88	2.65 125 <0015>	2.44 102 <2045>	2.53	112	-0.09W	0.01	264 264 262 261 260 260 258 257 256 255 254 253 251 251 249 249 247 247 246 245 244 244 244 244
05/05/88	2.46 104 <2345>	2.44 102 <0015>	2.44	102	-0.09W	0.01	244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 244 245 245 245 246
05/06/88	2.52 111 <1330>	2.46 104 <0015>	2.49	107	-0.09W	0.01	246 247 247 246 246 246 246 246 246 246 246 249 251 252 252 252 252 252 252 251 251 250 249 249
05/07/88	2.48 108 <0045>	2.33 91 <2400>	2.41	100	-0.08W	0.01	248 248 247 246 245 245 244 243 243 243 242 241 240 240 238 238 237 237 236 236 235 234 234 233
05/08/88	2.33 91 <0015>	2.28 86 <2030>	2.30	88	-0.08W	0.01	233 232 232 232 231 230 230 230 230 230 229 229 229 229 229 229 229 229 229 229 228 228 228 228
05/09/88	2.35 95 <2315>	2.27 85 <0045>	2.29	87	-0.08W	0.01	227 227 227 227 227 227 227 227 227 227 227 227 228 228 228 229 229 230 230 231 232 233 234 235
05/10/88	2.45 105 <0715>	2.36 96 <0015>	2.43	103	-0.07W	0.01	238 239 240 241 244 244 244 245 245 245 245 245 245 245 245 245 244 244 243 242 241 240 239 238
05/11/88	2.38 98 <0015>	2.32 91 <2230>	2.34	94	-0.07W	0.01	238 237 236 236 236 235 235 235 234 234 234 234 234 233 233 233 233 233 233 233 233 233 232 232
PERIOD	2.65 125	1.88 45			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.

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, 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.

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. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. 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. All other samples are analyzed in either the U.S. Geological Survey laboratory in Arvada, Colo., or the North Dakota State Water Commission 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 included in this report and identified with footnotes. The sampling times indicated on the "splits" are one minute later than the regular samples.

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.

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 1987. 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, every fifth day and at the end of the month (EOM) are published; taped measurements are not published for wells equipped with continuous recorders. 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. 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 four 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 (C.D. Bader, North Dakota State Water Commission, oral commun., 1988) 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 irrigation season and a subsequent water-level recovery.

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

The 1988 hydrograph 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 maximum and minimum recorded daily water levels 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 almost half a foot at this site at times during the 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 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.

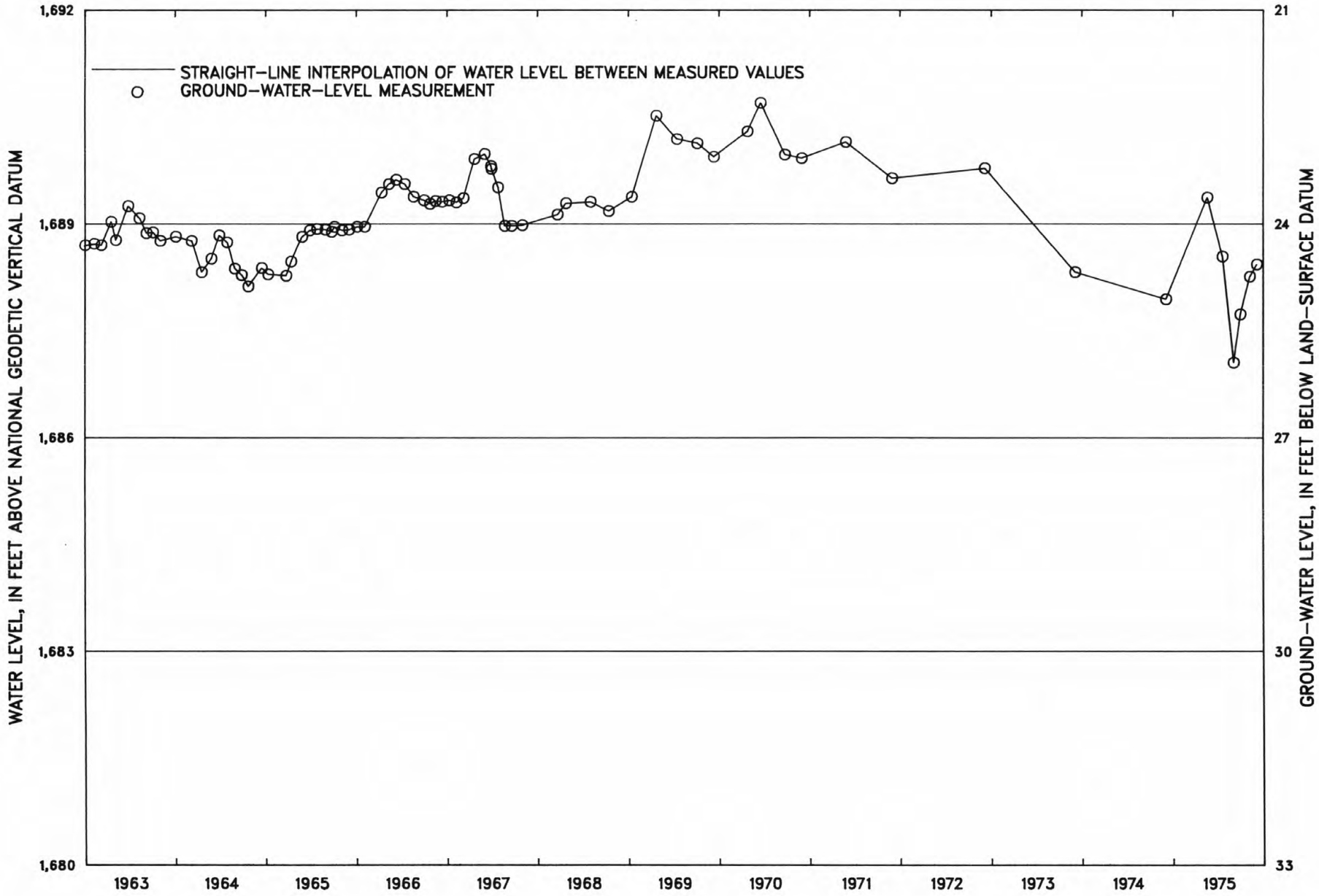

Figure 16a.--Water levels in well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1963-75.

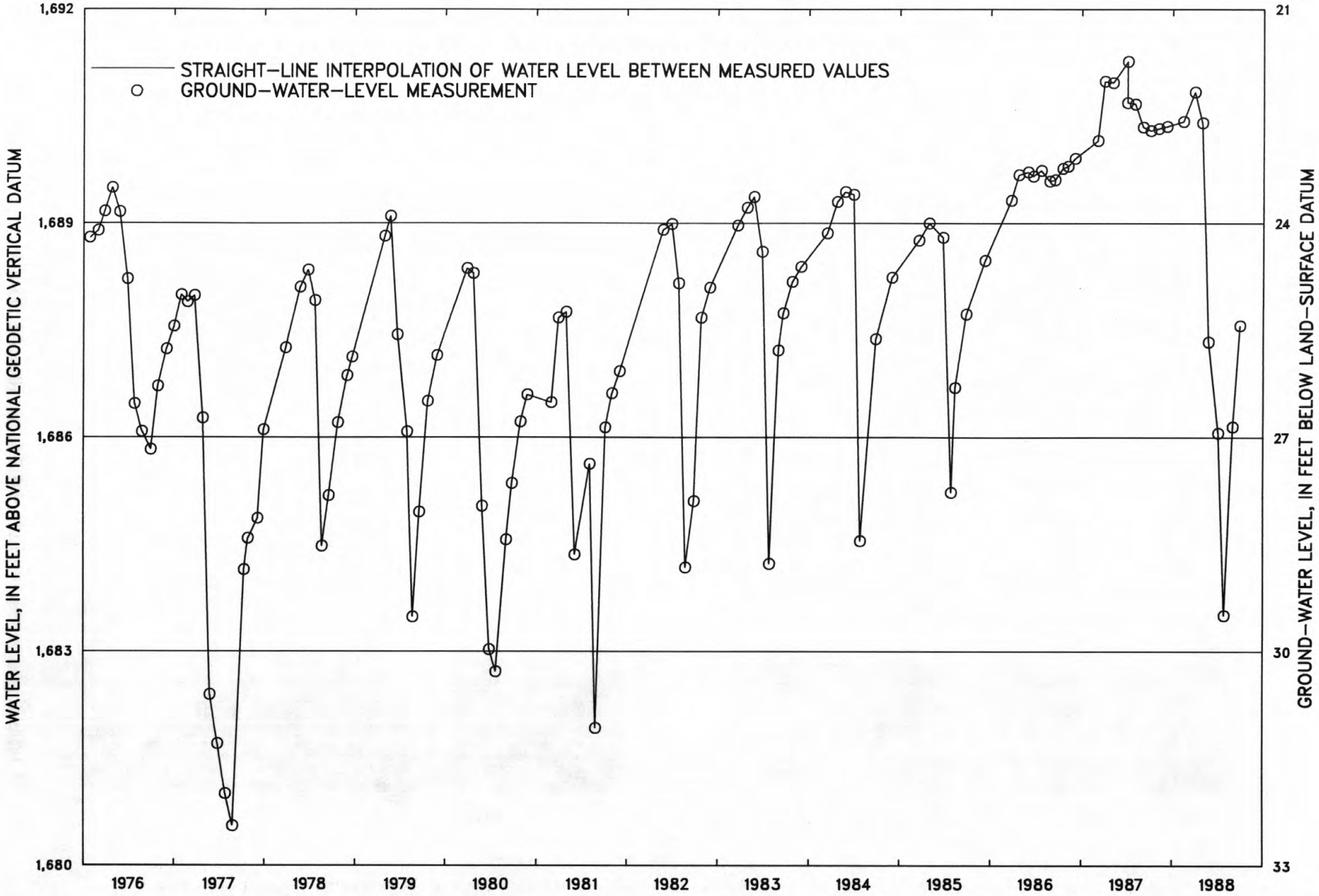

Figure 16b.--Water levels in well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1976-88.

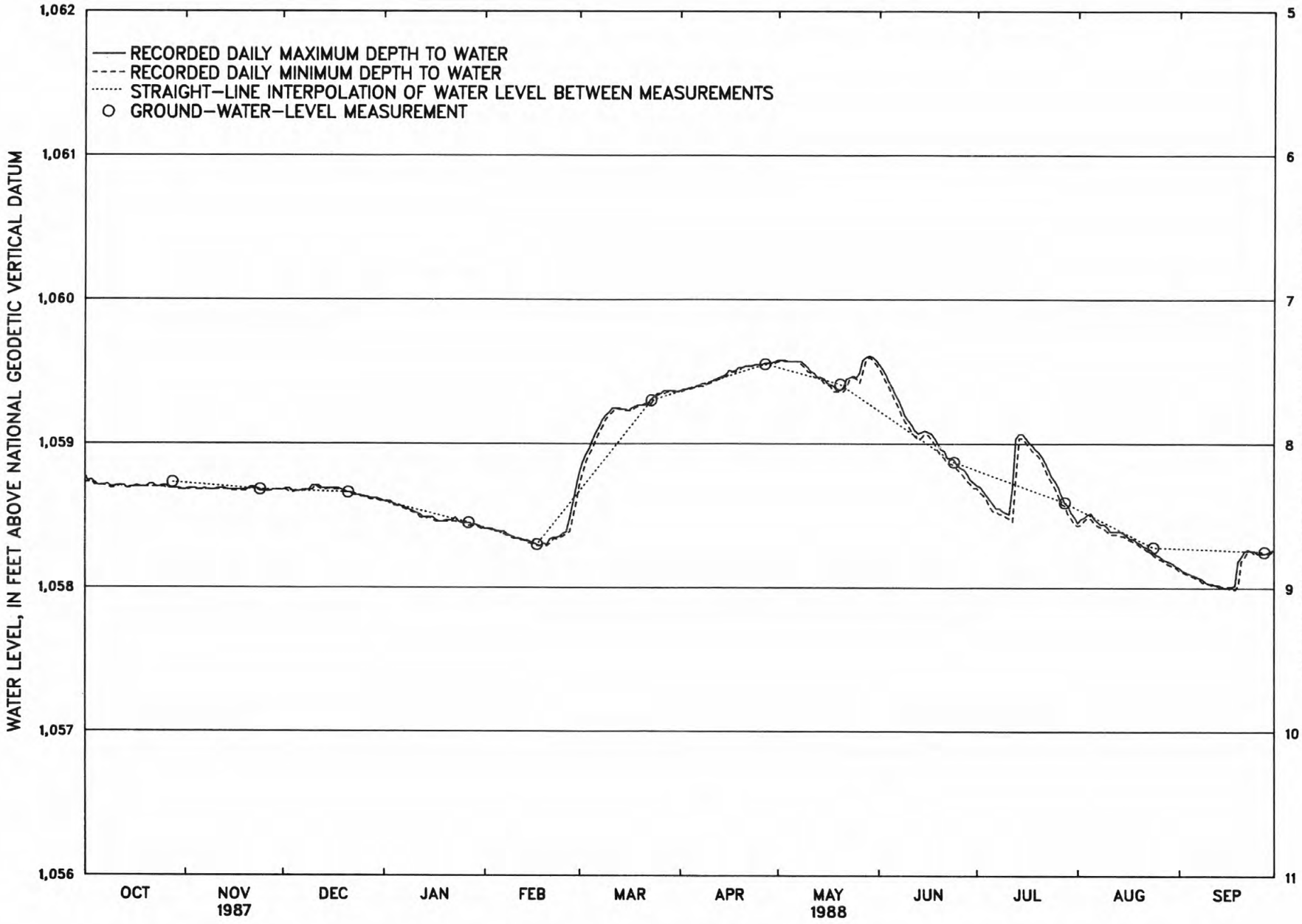

Figure 17.--Water levels in recorder well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, water year 1988.

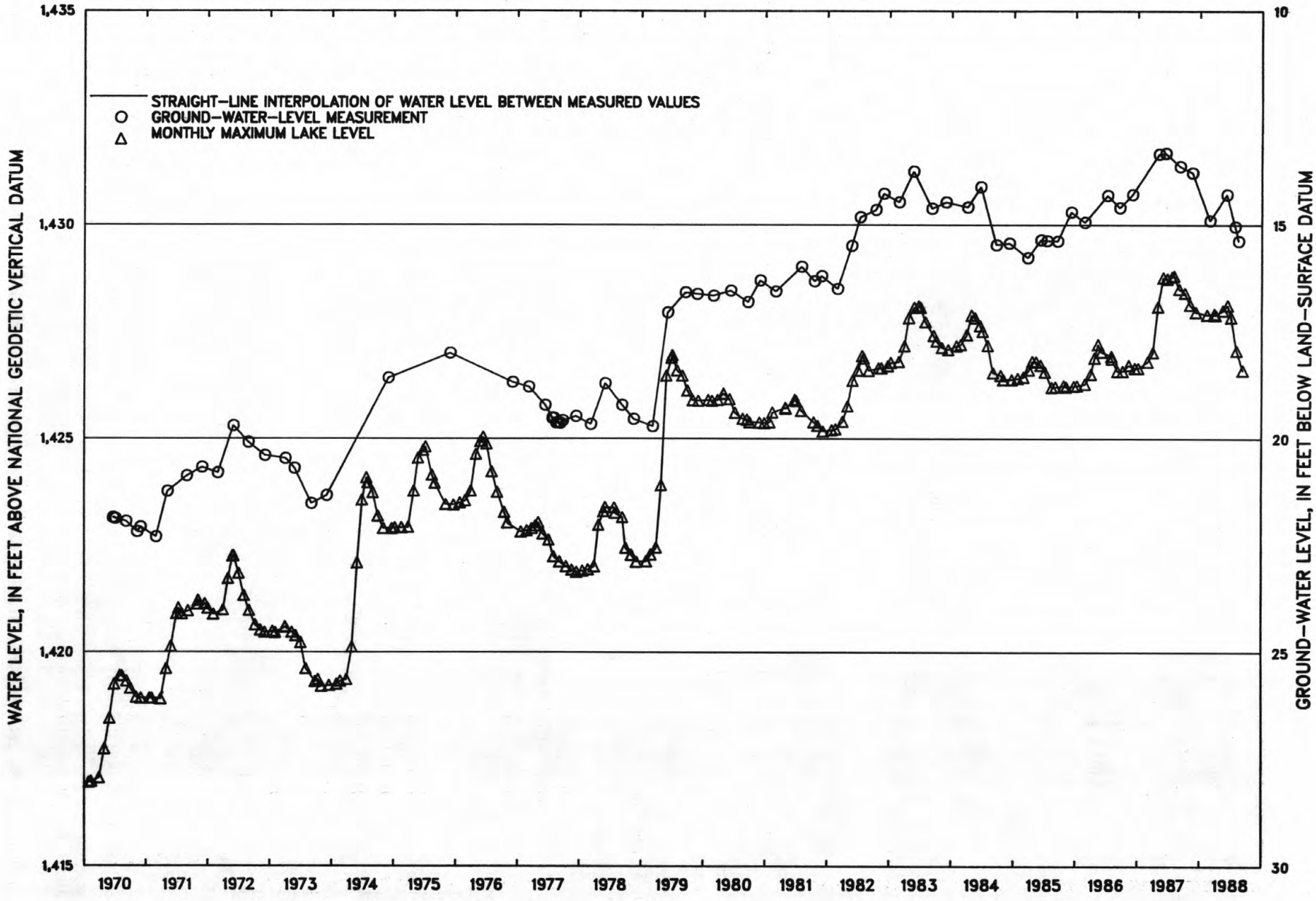

Figure 18.--Water levels in well 153-063-30CBC completed in Spiritwood aquifer, Benson County, and monthly maximum water levels in Devils Lake, 1970-88.

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, Virginia.

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
437 National Center
Reston, Virginia 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 44.5oC plus or minus 0.2oC 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 35oC plus or minus 1.0oC 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 chloro-platinate 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 x 10-12) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 1010 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. 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 25oC. 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 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 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 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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-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.

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. J. 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 and dispersion in streams by dye tracing, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 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-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 programed test 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-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. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 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 analysis of organic substances in water, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.

5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 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. Schaffrannek, 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 NE1/4 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 mi^2, 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. 22 to Mar 28. Records good except those for period 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.--45 years (1944-88), 549 ft^3/s, 397,800 acre-ft/yr; median of yearly mean discharges, 480 ft^3/s, 348,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,200 ft^3/s, Apr. 10, 1969, gage height, 16.34 ft; minimum daily, 1.7 ft^3/s, Aug. 28 to Sept. 5, 9, 10, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 17.0 ft, discharge, 10,500 ft^3/s, occurred in the spring of 1897 and has not been exceeded since.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 911 ft^3/s, Mar. 27, gage height, 5.58 ft, backwater from ice; minimum daily, 57 ft^3/s, Sept. 23-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	167	186	111	161	220	366	461	432	368	143	93	83
2	164	187	114	190	247	357	462	401	301	125	148	74
3	172	187	113	190	282	341	471	416	291	92	141	71
4	169	183	114	190	233	338	461	414	288	82	123	73
5	167	183	102	180	139	372	478	407	284	80	101	73
6	173	183	116	190	143	443	500	401	280	75	96	72
7	174	179	114	190	200	538	504	390	279	76	90	72
8	170	175	114	190	260	627	471	393	281	79	89	70
9	165	173	113	190	250	650	410	410	276	83	88	69
10	161	179	113	190	245	701	410	411	277	86	81	71
11	143	157	113	180	240	758	409	403	247	81	79	72
12	141	133	115	132	240	657	406	377	195	89	83	70
13	141	128	134	100	244	483	406	330	201	185	88	72
14	137	124	163	105	248	425	429	266	219	142	92	73
15	129	123	200	110	252	465	464	265	207	91	86	74
16	129	131	168	115	256	508	458	276	199	70	81	88
17	129	132	170	110	260	527	443	298	196	63	77	84
18	124	122	185	110	259	464	449	327	193	60	78	64
19	123	133	190	110	257	427	435	336	190	58	78	96
20	123	104	190	120	254	447	367	344	190	58	78	79
21	126	119	190	143	223	448	304	358	191	59	78	65
22	130	131	190	161	270	480	313	385	191	61	79	59
23	144	130	188	146	280	518	369	368	202	59	78	57
24	131	128	160	132	290	633	411	374	188	78	76	57
25	128	124	120	123	300	753	400	405	160	85	76	57
26	119	128	105	108	323	662	390	406	155	82	75	57
27	122	127	119	138	345	855	412	421	151	81	77	57
28	138	126	123	157	358	693	410	421	147	79	77	64
29	147	122	130	162	360	517	392	412	147	83	78	72
30	152	120	160	182	---	474	408	407	147	83	79	69
31	166	---	180	200	---	467	---	406	---	86	78	---
TOTAL	4504	4357	4417	4705	7478	16394	12703	11660	6641	2654	2721	2114
MEAN	145	145	142	152	258	529	423	376	221	85.6	87.8	70.5
MAX	174	187	200	200	360	855	504	432	368	185	148	96
MIN	119	104	102	100	139	338	304	265	147	58	75	57
AC-FT	8930	8640	8760	9330	14830	32520	25200	23130	13170	5260	5400	4190

CAL YR 1987 TOTAL 158667 MEAN 435 MAX 1700 MIN 54 AC-FT 314700
WTR YR 1988 TOTAL 80348 MEAN 220 MAX 855 MIN 57 AC-FT 159400

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
27...	1010	120	--	--	2.5	4.0	--	--	--	--	--
DEC											
16...	1430	169	555	--	-7.0	0.0	--	--	--	--	--
FEB											
04...	1125	242	562	--	-21.0	0.0	--	--	--	--	--
APR											
06...	1045	510	522	8.10	14.0	5.5	250	47	32	13	10
MAY											
11...	1105	407	690	--	21.5	17.0	--	--	--	--	--
JUN											
15...	1300	212	460	--	21.5	22.5	--	--	--	--	--
JUL											
07...	1305	84	495	--	22.5	27.5	--	--	--	--	--
27...	1020	79	460	8.60	28.0	27.0	220	35	32	12	10
AUG											
30...	1140	79	472	--	22.0	18.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	0.4	5.4	240	51	13	0.10	12	324	315	446	0.44
JUL											
27...	0.4	5.8	220	32	14	0.20	3.9	248	277	53.2	0.34

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										
06...	3	160	10	<1	18	<10	<0.1	1	1	200
JUL										
27...	4	90	10	<1	20	<10	0.1	1	<1	270

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 mi^2, 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. 18 to Mar. 1. Records good except those for period 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.--13 years, 616 ft^3/s, 446,300 acre-ft/yr; median of yearly mean discharges, 530 ft^3/s, 384,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,600 ft^3/s, Apr. 18, 1979, gage height, 33.03 ft; no flow Oct. 26, 1976, to Jan. 9, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 826 ft^3/s, Mar. 30, gage height, 10.97 ft; minimum daily, 53 ft^3/s, July 20, 21, 22 and Sept. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	149	127	168	125	356	684	405	419	126	75	78
2	157	162	114	183	178	370	689	430	420	128	96	85
3	164	184	96	158	205	368	699	425	377	129	101	87
4	167	190	89	159	229	362	671	394	328	114	137	79
5	175	195	89	197	262	356	587	401	311	93	141	75
6	176	194	102	203	230	368	517	399	305	76	118	74
7	173	186	108	165	192	397	527	394	300	72	104	74
8	178	179	118	176	165	438	543	408	292	75	94	70
9	175	179	130	190	175	524	535	398	283	76	89	71
10	173	171	124	179	204	613	480	401	290	74	83	68
11	163	175	122	190	235	673	442	412	291	78	79	68
12	157	183	120	190	258	685	444	411	285	80	93	66
13	144	171	113	179	248	688	421	395	261	89	82	70
14	138	141	115	166	245	621	416	369	225	141	88	71
15	137	131	134	117	224	500	411	315	215	187	89	70
16	136	136	163	102	229	425	441	265	213	139	92	75
17	131	141	173	98	248	419	459	259	205	90	86	81
18	125	144	176	95	258	452	459	271	207	67	81	86
19	126	144	167	100	264	476	449	305	203	57	77	93
20	123	102	184	103	258	458	453	341	205	53	77	90
21	121	82	200	110	245	428	435	362	212	53	76	88
22	126	101	206	118	274	430	362	388	197	53	75	85
23	132	132	210	142	240	434	308	401	201	55	75	74
24	156	135	210	162	257	459	310	422	204	56	76	63
25	183	135	200	148	263	509	370	404	183	57	75	57
26	159	148	192	132	270	597	399	404	171	63	75	56
27	128	131	145	144	276	672	382	431	148	72	69	54
28	117	139	115	112	296	680	400	436	139	73	71	53
29	113	148	120	130	321	773	412	441	130	73	74	56
30	126	142	125	144	---	818	409	436	127	75	77	60
31	142	---	139	140	---	752	---	423	---	72	77	---
TOTAL	4569	4550	4426	4600	6874	16101	14114	11946	7347	2646	2702	2177
MEAN	147	152	143	148	237	519	470	385	245	85.4	87.2	72.6
MAX	183	195	210	203	321	818	699	441	420	187	141	93
MIN	113	82	89	95	125	356	308	259	127	53	69	53
AC-FT	9060	9020	8780	9120	13630	31940	28000	23690	14570	5250	5360	4320

CAL YR 1987 TOTAL 178772 MEAN 490 MAX 2430 MIN 61 AC-FT 354600
WTR YR 1988 TOTAL 82052 MEAN 224 MAX 818 MIN 53 AC-FT 162800

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
27...	1445	133	550	--	5.0	4.5	--	--	--	--	--
FEB											
04...	1535	242	570	--	-20.0	0.0	--	--	--	--	--
APR											
06...	1535	505	555	8.20	22.0	4.0	260	50	33	14	10
MAY											
11...	1725	422	675	--	23.0	16.5	--	--	--	--	--
JUN											
16...	1600	218	520	--	30.0	23.0	--	--	--	--	--
JUL											
13...	1335	89	480	--	26.0	24.0	--	--	--	--	--
26...	1530	65	480	8.60	34.0	28.0	210	39	28	15	13
SEP											
01...	1110	77	--	--	23.0	19.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	0.4	5.6	230	76	13	0.20	12	349	339	476	0.47
JUL											
26...	0.5	6.1	170	82	12	0.20	9.1	286	296	50.2	0.39

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										
06...	2	160	20	<1	21	<10	0.2	2	1	210
JUL										
26...	3	130	10	<1	20	<10	0.5	2	<1	280

05051600 WILD RICE RIVER NEAR RUTLAND, ND

LOCATION.--Lat 46°01'20", long 97°30'40", in SE1/4SE1/4 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.--Estimated daily discharges: Feb. 25 to Mar. 8. Records fair.

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.--Maximum discharge, about 1.0 ft^3/s, Feb. 27, gage height, unknown; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	.37	.00	.00	.00	.00	.00	.00
2					.00	.30	.00	.00	.00	.00	.00	.00
3					.00	.25	.00	.00	.00	.00	.00	.00
4					.00	.20	.00	.00	.00	.00	.00	.00
5					.00	.15	.00	.00	.00	.00	.00	.00
6					.00	.10	.00	.00	.00	.00	.00	.00
7					.00	.05	.00	.00	.00	.00	.00	.00
8					.00	.02	.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					.10	.00	.00	.00	.00	.00	.00	.00
26					.50	.00	.00	.00	.00	.00	.00	.00
27					.90	.00	.00	.00	.00	.00	.00	.00
28					.70	.00	.00	.00	.00	.00	.00	.00
29					.50	.00	.00	.00	.00	.00	.00	.00
30					---	.00	.00	.00	.00	.00	.00	.00
31					---	.00	---	.00	---	.00	.00	---
TOTAL					2.70	1.44	0.00	0.00	0.00	0.00	0.00	0.00
MEAN					.093	.046	.00	.00	.00	.00	.00	.00
MAX					.90	.37	.00	.00	.00	.00	.00	.00
MIN					.00	.00	.00	.00	.00	.00	.00	.00
AC-FT					5.4	2.9	.0	.0	.0	.0	.0	.0

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 mi^2, of which about 590 mi^2 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: Mar. 1-20, May 21 to June 16. Records good, except those for period of ice effect, Feb. 28 to Mar. 28, 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.--56 years, 72.4 ft^3/s, 52,450 acre-ft/yr; median of yearly mean discharges, 36 ft^3/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,540 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 10	2045	*105	a*2.33				

No flow much of the time.
a - Backwater from ice.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	33	.23	.35	.00	.0	.00
2	.00	.00	.00	.00	.00	.00	33	.21	.40	.00	.07	.00
3	.00	.00	.00	.00	.00	.00	33	.21	.40	.00	.07	.00
4	.00	.00	.00	.00	.00	.00	30	6.0	.35	.00	.07	.00
5	.00	.00	.00	.00	.00	.80	29	7.9	.30	.00	.05	.00
6	.00	.00	.00	.00	.00	3.5	27	4.7	.20	.00	.03	.00
7	.00	.00	.00	.00	.00	6.5	23	2.9	.15	.00	.19	.00
8	.00	.00	.00	.00	.00	15	20	3.1	.10	.00	5.6	.00
9	.00	.00	.00	.00	.00	35	20	4.2	.07	.00	8.9	.00
10	.00	.00	.00	.00	.00	90	17	3.1	.05	.00	6.8	.00
11	.00	.00	.00	.00	.00	85	15	1.9	.03	.00	3.9	.00
12	.00	.00	.00	.00	.00	50	14	1.6	.02	.00	2.0	.00
13	.00	.00	.00	.00	.00	40	12	1.3	.01	.00	1.6	.00
14	.00	.00	.00	.00	.00	25	11	1.0	.04	.08	1.4	.00
15	.00	.00	.00	.00	.00	20	9.8	.84	.06	27	1.0	.00
16	.00	.00	.00	.00	.00	19	8.5	.74	.01	44	.82	.00
17	.00	.00	.00	.00	.00	18	5.7	.65	.00	29	.66	.00
18	.00	.00	.00	.00	.00	17	5.1	.53	.00	14	.53	.00
19	.00	.00	.00	.00	.00	19	4.1	.47	.00	6.5	.41	.00
20	.00	.00	.00	.00	.00	23	2.6	.46	.00	2.7	.32	.00
21	.00	.00	.00	.00	.00	27	1.5	.45	.00	1.2	.24	.00
22	.00	.00	.00	.00	.00	30	.87	.35	.00	.74	.18	.00
23	.00	.00	.00	.00	.00	32	.55	.30	.00	.54	.13	.00
24	.00	.00	.00	.00	.00	42	.45	.27	.00	.43	.10	.00
25	.00	.00	.00	.00	.00	50	.37	.25	.00	.28	.08	.00
26	.00	.00	.00	.00	.00	38	.31	.22	.00	.20	.06	.00
27	.00	.00	.00	.00	.00	41	.28	.18	.00	.14	.05	.00
28	.00	.00	.00	.00	.00	48	.25	.14	.00	.08	.04	.00
29	.00	.00	.00	.00	.00	41	.23	.10	.00	.06	.03	.00
30	.00	.00	.00	.00	---	41	.23	.08	.00	.03	.01	.00
31	.00	---	.00	.00	---	38	---	.07	---	.01	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	894.80	357.84	44.45	2.54	126.99	35.34	0.00
MEAN	.00	.00	.00	.00	.00	28.9	11.9	1.43	.085	4.10	1.14	.00
MAX	.00	.00	.00	.00	.00	90	33	7.9	.40	44	8.9	.00
MIN	.00	.00	.00	.00	.00	.00	.23	.07	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	1770	710	88	5.0	252	70	.0

CAL YR 1987 TOTAL 10837.39 MEAN 29.7 MAX 676 MIN .00 AC-FT 21500
WTR YR 1988 TOTAL 1461.96 MEAN 3.99 MAX 90 MIN .00 AC-FT 2900

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR											
23...	1400	30	810	7.60	3.0	0.5	320	70	34	43	22
MAY											
11...	1440	1.8	1170	--	25.0	21.0	--	--	--	--	--
JUN											
15...	1630	0.04	--	--	31.0	26.0	--	--	--	--	--
JUL											
27...	1425	0.13	745	8.40	35.5	28.0	250	53	28	64	35
AUG											
30...	1330	0.01	2000	--	23.0	17.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
23...	1	12	200	210	24	0.20	15	555	529	45.7	0.75
JUL											
27...	2	12	210	150	35	0.30	19	494	491	0.17	0.67

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)
MAR										
23...	3	180	40	<1	49	220	0.6	2	2	340
JUL										
27...	14	170	10	<1	50	<10	<1.0	2	<1	370

05054000 RED RIVER OF THE NORTH AT FARGO, ND

LOCATION.--Lat 46°51'40", long 96°47'00", in NW1/4NE1/4 sec.18, T.139 N., R.48 W., Cass County, Hydrologic Unit 09020104, at city waterplant on 4th St. S. in Fargo, 25 mi upstream from mouth of Sheyenne River, and at mile 453.0.

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. 13 to Mar. 3. Records good except those for period 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).--87 years, 576 ft^3/s, 417,300 acre-ft/yr; median of yearly mean discharges, 450 ft^3/s, 326,000 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, 981 ft^3/s, Mar. 11, gage height, 15.10 ft; minimum daily, 15 ft^3/s, July 22, 25, and 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	135	125	121	125	317	832	412	395	105	45	45
2	146	140	113	154	142	339	768	415	387	112	87	39
3	154	155	101	161	182	364	799	421	369	121	86	52
4	153	174	85	151	219	367	802	405	319	116	106	57
5	162	183	78	166	256	386	804	412	278	101	145	51
6	161	182	84	182	276	380	696	414	258	73	152	41
7	157	179	96	203	280	396	605	441	249	66	136	43
8	164	175	104	182	239	451	601	426	240	51	112	39
9	166	177	115	181	211	495	595	410	238	55	93	33
10	161	170	132	202	235	662	564	413	234	56	88	34
11	163	165	136	194	245	924	491	412	233	49	67	41
12	158	174	131	202	259	909	455	440	235	49	55	38
13	151	174	118	195	275	831	434	431	259	66	92	42
14	136	149	107	204	278	828	428	392	272	58	78	41
15	137	132	105	177	271	739	426	352	206	123	67	63
16	139	129	121	135	249	603	428	304	199	166	65	100
17	141	127	157	93	251	519	454	267	191	130	61	85
18	136	128	173	92	240	497	472	263	181	76	59	145
19	138	130	161	83	235	514	463	273	175	46	48	191
20	135	115	160	78	230	517	455	328	157	28	51	99
21	134	90	166	82	233	488	448	379	164	21	53	98
22	128	76	180	79	244	469	405	386	156	15	48	93
23	129	94	194	99	234	499	339	394	172	16	41	86
24	136	108	203	137	225	575	307	409	166	20	39	78
25	161	126	211	161	244	684	324	415	161	15	38	65
26	162	125	207	120	296	721	382	397	164	15	35	53
27	130	136	175	131	311	792	399	429	142	21	39	45
28	121	124	133	128	314	867	383	427	120	40	40	57
29	110	133	98	107	284	833	391	440	112	46	39	59
30	108	139	97	113	---	901	414	441	110	45	37	52
31	123	---	107	141	---	900	---	417	---	51	40	---
TOTAL	4442	4244	4173	4454	7083	18767	15364	12165	6542	1952	2142	1965
MEAN	143	141	135	144	244	605	512	392	218	63.0	69.1	65.5
MAX	166	183	211	204	314	924	832	441	395	166	152	191
MIN	108	76	78	78	125	317	307	263	110	15	35	33
AC-FT	8810	8420	8280	8830	14050	37220	30470	24130	12980	3870	4250	3900
(+)	1302	1167	1181	1249	1107	1233	1323	1675	2064	2073	1689	1596
MEAN*	164	161	154	164	263	625	534	419	253	96.7	96.6	92.3
AC-FT*	10110	9590	9460	10080	15160	38450	31790	25800	15040	5940	5940	5500

		OBSERVED						ADJUSTED		
CAL YR 1987	TOTAL 184803	MEAN 506	MAX 2980	MIN 40	AC-FT 366600		MEAN 530	AC-FT 383090		
WTR YR 1988	TOTAL 83293	MEAN 228	MAX 924	MIN 15	AC-FT 165200		MEAN 252	AC-FT 182870		

\+ - Diversions in acre-feet to cities of Fargo and Moorhead.
* - 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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
27...	1715	125	535	--	6.0	5.0	--	--	--	--	--
DEC											
21...	1605	166	600	--	-2.0	0.0	--	--	--	--	--
FEB											
18...	1130	238	730	--	0.0	0.0	--	--	--	--	--
APR											
07...	1640	592	570	8.20	26.0	3.5	230	46	28	15	12
MAY											
13...	1055	428	530	--	11.0	17.5	--	--	--	--	--
JUN											
17...	0955	195	510	--	20.0	23.0	--	--	--	--	--
JUL											
12...	1230	48	490	--	28.0	24.0	--	--	--	--	--
26...	1305	15	455	8.80	24.0	26.5	210	26	36	14	12
28...	0810	34	480	--	24.0	26.0	--	--	--	--	--
AUG											
30...	1610	37	510	--	26.0	22.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	0.4	5.3	210	74	11	0.10	10	325	314	519	0.44
JUL											
26...	0.4	5.8	210	44	14	0.30	9.0	264	274	10.9	0.36

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										
07...	4	170	10	<1	20	<10	0.3	1	1	210
JUL										
26...	4	130	10	<1	20	<10	0.1	2	<1	220

05054500 SHEYENNE RIVER ABOVE HARVEY, ND

LOCATION.--Lat 47°42'10", long 99°56'55", in SW1/4SE1/4 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 mi^2, of which about 270 mi^2 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: Nov. 23 to Apr. 7 and Aug. 18 to Sept. 30. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--33 years, 8.40 ft^3/s, 6,090 acre-ft/yr; median of yearly mean discharges, 7.5 ft^3/s, 5,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,000 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	----	ab*80	Unknown				

No flow for many days.
a - Backwater from ice.
b - Estimate

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.68	1.1	.82	.10	.00	5.0	5.4	1.9	1.7	1.2	.00	.65
2	.64	1.3	.84	.05	.00	4.5	6.0	2.3	1.1	1.5	4.4	.65
3	2.2	1.3	.82	.02	.00	4.0	7.0	2.3	1.4	1.6	6.6	.65
4	7.2	1.3	.80	.00	.00	3.0	6.5	2.1	1.3	1.6	2.2	.64
5	5.3	1.1	.78	.00	.00	3.5	6.0	2.3	1.3	2.0	1.6	.60
6	4.5	.66	.84	.00	.00	3.0	5.0	2.5	1.3	1.3	1.2	.60
7	3.7	.93	.80	.00	.00	2.7	6.0	3.8	.99	1.2	.85	.60
8	3.3	1.0	.80	.00	.00	2.5	5.2	3.0	1.2	.95	.79	.65
9	2.6	1.3	.80	.00	.00	3.0	4.3	3.1	1.4	.40	.86	.60
10	2.4	1.3	.90	.00	.00	2.5	4.2	3.0	1.1	.31	.85	.60
11	2.2	1.2	.80	.00	.00	1.0	4.3	4.1	.74	.27	.93	.62
12	.64	11	.70	.00	.00	.50	4.3	3.9	1.7	.28	1.1	.60
13	.50	2.3	.66	.00	.00	.40	4.1	3.3	2.1	.19	1.2	.60
14	.48	1.3	.65	.00	.00	.30	4.1	2.9	2.2	.11	1.3	.70
15	.48	1.1	.64	.00	.00	.25	3.9	2.8	2.8	.13	1.4	.75
16	.46	1.0	.60	.00	.00	.25	3.4	2.6	2.1	.19	1.5	.70
17	.45	1.1	.70	.00	.00	.27	2.9	2.4	1.8	.19	1.6	.65
18	.45	1.3	.72	.00	.00	.45	2.9	2.5	1.8	.99	1.4	1.5
19	.50	1.7	.70	.00	.00	.80	2.6	2.2	2.0	9.7	1.2	1.8
20	.86	1.3	.68	.00	.00	.90	2.4	1.8	1.9	2.4	1.0	1.4
21	.95	1.1	.67	.00	.00	2.0	2.3	1.7	2.5	1.0	.95	1.0
22	1.1	1.0	.66	.00	.00	3.0	2.6	1.5	2.3	.52	.90	.70
23	1.1	.98	.66	.00	.00	10	2.5	1.5	2.4	.16	.85	.60
24	1.1	.94	.64	.00	.01	20	2.5	1.4	2.3	.08	.82	.55
25	2.0	.90	.60	.00	.20	50	2.4	1.5	1.8	.06	.80	.52
26	3.6	.90	.56	.00	1.0	80	2.4	1.8	1.3	.25	.84	.50
27	2.2	.90	.50	.00	8.0	35	2.4	2.1	1.2	.07	.82	.60
28	1.6	.90	.45	.00	7.0	20	2.2	1.7	1.5	.03	.75	.80
29	1.3	.86	.40	.00	6.0	10	1.9	1.6	1.1	.01	.70	.60
30	1.1	.82	.35	.00	---	8.0	1.9	1.5	.65	.00	.70	.50
31	1.1	---	.15	.00	---	5.0	---	1.6	---	.00	.70	---
TOTAL	56.69	43.89	20.69	0.17	22.21	281.82	113.6	72.7	48.98	28.69	40.82	21.93
MEAN	1.83	1.46	.67	.005	.77	9.09	3.79	2.35	1.63	.93	1.32	.73
MAX	7.2	11	.90	.10	8.0	80	7.0	4.1	2.8	9.7	6.6	1.8
MIN	.45	.66	.15	.00	.00	.25	1.9	1.4	.65	.00	.00	.50
AC-FT	112	87	41	.3	44	559	225	144	97	57	81	43

CAL YR 1987 TOTAL 5238.38 MEAN 14.4 MAX 386 MIN .15 AC-FT 10390
WTR YR 1988 TOTAL 752.19 MEAN 2.06 MAX 80 MIN .00 AC-FT 1490

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
NOV 19...	1000	1.7	1300	8.38	0.0	0.5	14	12.6	87	230	46	27
MAR 28...	1210	17	760	--	1.0	1.0	--	--	--	--	--	--
APR 14...	1100	4.1	1140	8.33	2.0	3.0	47	11.0	81	170	33	22
MAY 16...	1300	2.8	1320	8.50	18.0	11.5	33	12.4	113	170	35	20
JUL 07...	1615	1.2	1420	8.50	27.5	27.5	75	10.6	133	110	24	11
AUG 09...	1139	0.90	1480	8.95	25.5	18.0	57	6.5	69	63	14	6.7

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)
NOV 19...	220	67	7	7.0	461	180	16	0.30	32	828	806	1.13
APR 14...	200	70	7	9.5	431	190	14	0.30	26	779	754	1.06
MAY 16...	270	77	9	6.4	531	200	15	0.40	31	909	897	1.24
JUL 07...	310	86	14	5.6	572	200	17	0.30	37	968	949	1.32
AUG 09...	330	91	19	4.9	574	190	17	0.30	26	972	934	1.32

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)
NOV 19...	3.71	0.230	0.090	--	--	--	550	--	--	--	--	--
APR 14...	8.58	<0.100	0.200	<10	2	52	580	<1	1	1	1	60
MAY 16...	6.87	<0.100	0.210	--	--	--	700	--	--	--	--	--
JUL 07...	3.21	<0.100	0.320	--	--	--	870	--	--	--	--	--
AUG 09...	2.36	<0.100	0.140	20	3	34	880	<1	<1	1	3	210

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)
APR 14...	<5	92	140	<0.1	1	2	<1	190	5	<3	<0.010
AUG 09...	<5	130	28	<0.1	<1	2	<1	130	3	<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. 21 to Apr. 10 and Aug. 7-11. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--39 years, 56.9 ft^3/s, 41,220 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, 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)
Mar. 25	----	*151	a*2.88				

Minimum daily discharge, 0.01 ft^3/s, Aug. 8-11.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	20	16	10	5.4	114	58	20	7.4	1.3	.20	.88
2	15	19	16	8.6	5.2	103	64	19	10	1.4	.30	.89
3	15	19	15	8.5	5.0	90	68	19	12	1.5	.29	.87
4	16	19	15	8.0	5.0	72	90	23	14	1.1	.19	.84
5	15	19	15	7.0	4.8	64	88	24	25	1.6	.14	.99
6	17	20	15	5.5	4.5	69	78	23	27	1.0	.05	.96
7	25	21	15	5.4	4.3	75	73	24	21	.38	.02	.93
8	26	19	17	5.3	4.1	71	85	26	15	.19	.01	1.3
9	19	16	20	4.9	4.0	68	86	30	12	.21	.01	.96
10	18	15	20	4.7	4.0	72	94	32	9.4	.30	.01	.82
11	18	15	22	4.6	3.9	72	77	34	7.6	.45	.01	1.4
12	18	16	22	4.6	4.0	44	58	35	7.8	1.3	.12	2.4
13	18	16	20	4.5	4.0	51	56	36	8.1	1.5	.25	3.3
14	16	17	19	4.7	4.2	52	53	34	8.1	1.1	.57	3.7
15	16	19	19	4.8	4.4	45	49	31	7.2	.86	2.6	3.9
16	16	19	19	5.0	4.8	29	42	32	5.6	.41	4.6	5.1
17	15	21	19	5.0	5.2	22	37	38	5.0	.52	4.7	5.3
18	14	21	18	5.0	5.5	19	36	33	7.7	.54	3.1	5.1
19	15	21	17	5.0	6.0	19	29	33	13	.43	1.6	7.7
20	22	18	15	5.0	5.8	20	26	26	15	.48	.30	7.7
21	20	18	15	5.0	6.3	24	26	25	18	.45	.22	7.6
22	17	18	14	5.0	6.9	32	23	26	20	.42	.29	7.6
23	15	17	13	5.5	6.6	47	22	22	25	.46	.36	3.0
24	14	16	13	6.0	6.6	90	22	19	27	.52	.33	1.3
25	14	16	12	5.8	6.7	143	21	19	7.6	.66	.35	.80
26	15	16	11	5.6	8.4	124	25	17	3.1	.50	.39	.84
27	16	16	11	5.6	13	94	23	17	2.0	.47	.48	.64
28	28	16	11	5.6	25	85	20	17	1.4	.46	.53	.74
29	33	16	10	5.6	58	78	20	13	1.3	.39	.58	.87
30	25	16	10	5.6	---	69	20	9.7	1.3	.32	.63	1.1
31	22	---	10	5.5	---	65	---	8.1	---	.19	.75	---
TOTAL	566	535	484	176.9	231.6	2022	1469	764.8	344.6	21.41	23.98	79.53
MEAN	18.3	17.8	15.6	5.71	7.99	65.2	49.0	24.7	11.5	.69	.77	2.65
MAX	33	21	22	10	58	143	94	38	27	1.6	4.7	7.7
MIN	13	15	10	4.5	3.9	19	20	8.1	1.3	.19	.01	.64
AC-FT	1120	1060	960	351	459	4010	2910	1520	684	42	48	158

CAL YR 1987 TOTAL 34450.6 MEAN 94.4 MAX 1680 MIN 5.9 AC-FT 68330
WTR YR 1988 TOTAL 6718.82 MEAN 18.4 MAX 143 MIN .01 AC-FT 13330

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
05...	1400	15	915	--	12.0	11.5	--	--	--	--	--
NOV											
19...	1210	17	695	--	-4.0	2.0	--	--	--	--	--
JAN											
06...	1250	5.5	965	--	-14.5	1.0	--	--	--	--	--
FEB											
29...	1449	54	1180	--	4.0	1.5	--	--	--	--	--
APR											
01...	1010	56	665	8.20	7.5	1.0	230	49	25	54	33
14...	1010	54	655	--	6.0	9.0	--	--	--	--	--
JUL											
11...	1525	0.51	655	8.40	25.0	26.5	230	47	28	51	32
AUG											
15...	1455	3.0	522	--	37.5	30.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
01...	2	9.3	237	100	14	0.20	15	401	409	60.2	0.55
JUL											
11...	1	5.9	280	60	11	0.20	20	403	394	0.55	0.55

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										
01...	2	210	60	1	37	50	0.2	2	2	240
JUL										
11...	8	120	30	1	40	340	0.2	1	<1	310

05056100 MAUVAIS COULEE NEAR CANDO, ND

LOCATION.--Lat 48°26'53", long 99°06'08", in SE¼NE¼SE¼ 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: Mar. 1-25. Records good except those for period of estimated daily discharges, which are fair.

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, 1.3 ft^3/s, Mar. 27, gage height, 2.57 ft; no flow June 19 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.03	.68	.22	.07	.00	.00	.00
2						.01	.62	.25	.07	.00	.00	.00
3						.03	.56	.23	.07	.00	.00	.00
4						.08	.63	.21	.06	.00	.00	.00
5						17	.57	.20	.05	.00	.00	.00
6						.18	.55	.19	.04	.00	.00	.00
7						.15	.56	.26	.04	.00	.00	.00
8						.11	.63	.29	.03	.00	.00	.00
9						.18	.58	.27	.03	.00	.00	.00
10						.45	.66	.24	.03	.00	.00	.00
11						.20	.75	.24	.03	.00	.00	.00
12						.10	.79	.21	.03	.00	.00	.00
13						.08	.79	.18	.03	.00	.00	.00
14						.08	.71	.18	.02	.00	.00	.00
15						.09	.63	.17	.02	.00	.00	.00
16						.10	.56	.15	.02	.00	.00	.00
17						.11	.43	.14	.01	.00	.00	.00
18						.14	.42	.14	.01	.00	.00	.00
19						.12	.40	.12	.00	.00	.00	.00
20						.10	.36	.11	.00	.00	.00	.00
21						.15	.33	.11	.00	.00	.00	.00
22						.45	.32	.11	.00	.00	.00	.00
23						.60	.31	.10	.00	.00	.00	.00
24						.90	.29	.09	.00	.00	.00	.00
25						.74	.23	.10	.00	.00	.00	.00
26						.58	.22	.08	.00	.00	.00	.00
27						.97	.22	.09	.00	.00	.00	.00
28						1.2	.21	.09	.00	.00	.00	.00
29						.82	.20	.07	.00	.00	.00	.00
30						.78	.20	.07	.00	.00	.00	.00
31						.63	---	.07	---	.00	.00	---
TOTAL						10.33	14.41	4.98	0.66	0.00	0.00	0.00
MEAN						.33	.48	.16	.022	.00	.00	.00
MAX						1.2	.79	.29	.07	.00	.00	.00
MIN						.01	.20	.07	.00	.00	.00	.00
AC-FT						20	29	9.9	1.3	.0	.0	.0

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT										
06...	1140	0.14	690	--	6.5	12.0	--	--	--	--
MAR										
02...	1310	0.01	1320	--	1.5	1.0	--	--	--	--
23...	1110	0.41	1330	7.50	5.5	1.0	9.0	65	570	120
APR										
07...	1100	0.56	790	7.90	9.0	5.5	12.7	104	310	69
21...	1515	0.35	1220	8.40	9.5	11.0	12.1	113	480	100
JUN										
02...	1205	0.07	1790	8.00	26.0	27.5	9.1	118	760	150

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)
MAR										
23...	65	76	22	1	16	230	440	53	0.10	13
APR										
07...	34	38	20	1	9.6	149	230	24	0.10	7.8
21...	57	70	23	1	13	210	400	38	0.20	5.5
JUN										
02...	93	100	22	2	15	280	650	60	0.20	14

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
MAR										
23...	952	925	1.29	1.05	13	0.030	0.030	0.280	0.260	2
APR										
07...	505	503	0.69	0.76	4	0.050	0.010	0.010	0.130	2
21...	852	812	1.16	0.81	5	0.050	0.00	0.050	0.120	2
JUN										
02...	1320	1250	1.80	0.25	2	0.100	0.030	0.00	0.330	4

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)
MAR									
23...	70	90	<1	84	1400	0.1	1	3	510
APR									
07...	150	40	<1	45	460	<0.1	1	2	310
21...	150	30	<1	71	20	0.4	1	3	430
JUN									
02...	140	10	<1	120	220	0.1	1	1	790

05056200 EDMORE COULEE NEAR EDMORE, ND

LOCATION.--Lat 48°20'14", long 98°39'33", in NW1/4 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: Mar. 1 to Apr. 3. Records fair.

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 observed discharge, 49 ft^3/s, Apr. 4, gage height 82.63 ft; maximum observed gage height, 83.22 ft, Mar. 17, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	25	.40	5.6	.00	.00	.00	
2					.00	30	.20	13	.00	.00	.00	
3					.00	43	.11	15	.00	.00	.00	
4					.00	48	.09	11	.00	.00	.00	
5					.00	45	.06	7.5	.00	.00	.00	
6					.00	41	.05	4.6	.00	.00	.00	
7					.00	38	.04	2.7	.00	.00	.00	
8					.00	37	.06	1.5	.00	.00	.00	
9					.00	33	.05	.63	.00	.00	.00	
10					.00	26	.04	.16	.00	.00	.00	
11					.00	23	.03	.06	.00	.00	.00	
12					.00	19	.03	.03	.00	.00	.00	
13					.00	17	.03	.03	.00	.00	.00	
14					.00	14	.02	.02	.00	.00	.00	
15					.00	12	.02	.02	.00	.00	.00	
16					.00	11	.02	.01	.00	.00	.00	
17					.05	8.7	.02	.01	.00	.00	.00	
18					.10	7.3	.01	.01	.00	.00	.00	
19					.20	6.1	.01	.00	.00	.00	.00	
20					.30	5.1	.01	.00	.00	.00	.00	
21					.40	4.4	.01	.00	.00	.00	.00	
22					.50	3.6	.01	.00	.00	.00	.00	
23					5.0	3.1	.01	.00	.00	.00	.00	
24					6.0	2.6	.01	.00	.00	.00	.00	
25					10	2.3	.00	.00	.00	.00	.00	
26					8.0	2.0	.00	.00	.00	.00	.00	
27					5.0	1.8	.00	.00	.00	.00	.00	
28					3.5	1.4	.77	.00	.00	.00	.00	
29					4.0	1.1	4.0	.00	.00	.00	.00	
30					7.0	.80	3.6	.00	.00	.00	.00	
31					20	---	2.1	---	.00	.00	---	
TOTAL					70.05	512.30	11.81	61.88	0.00	0.00	0.00	
MEAN					2.26	17.1	.38	2.06	.00	.00	.00	
MAX					20	48	4.0	15	.00	.00	.00	
MIN					.00	.80	.00	.00	.00	.00	.00	
AC-FT					139	1020	23	123	.0	.0	.0	

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR										
22...	1135	0.47	588	--	1.5	0.5	--	--	--	--
APR										
06...	1230	42	695	8.10	11.5	6.0	13.1	108	240	59
20...	1330	5.2	950	8.40	1.0	6.0	11.8	97	330	79
JUN										
01...	1220	0.34	1180	8.10	29.0	25.0	9.4	117	400	85

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)
APR										
06...	23	43	26	1	18	168	170	22	0.10	24
20...	32	69	30	2	17	220	250	26	0.10	20
JUN										
01...	45	90	32	2	18	220	360	34	0.20	7.6

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
06...	463	461	0.63	52.6	3	0.060	0.040	<0.010	0.980	4
20...	653	627	0.89	9.10	5	0.100	0.010	0.160	0.520	3
JUN										
01...	798	771	1.09	0.73	0	0.080	0.010	0.040	0.630	5

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									
06...	130	40	<1	25	20	0.1	4	2	250
20...	140	40	<1	35	10	0.4	4	2	300
JUN									
01...	140	20	<1	50	340	0.4	3	1	430

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND

LOCATION.--Lat 48°15'59", long 98°40'50", in NW1/4 NW1/4 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 Bismarck.

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.--Estimated daily discharges: Mar. 1 to Apr. 2 and May 29 to June 1. 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.--Maximum discharge observed, 57 ft^3/s, Apr. 3, gage height, 70.10 ft; maximum gage height observed, 70.12 ft, Mar. 26, backwater from ice; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	15	.07	.00	.00	.00	.00
2						.00	30	.02	.00	.00	.00	.00
3						.00	57	.01	.00	.00	.00	.00
4						.00	35	.00	.00	.00	.00	.00
5						.00	30	.00	.00	.00	.00	.00
6						.00	21	.00	.00	.00	.00	.00
7						.00	20	.00	.00	.00	.00	.00
8						.00	21	.00	.00	.00	.00	.00
9						.00	23	.00	.00	.00	.00	.00
10						.00	16	.00	.00	.00	.00	.00
11						.00	12	.00	.00	.00	.00	.00
12						.00	12	.00	.00	.00	.00	.00
13						.00	11	.00	.00	.00	.00	.00
14						.00	9.6	.00	.00	.00	.00	.00
15						.00	7.8	.00	.00	.00	.00	.00
16						.00	6.1	.00	.00	.00	.00	.00
17						.00	4.8	.00	.00	.00	.00	.00
18						.00	3.7	.00	.00	.00	.00	.00
19						.00	3.0	.00	.00	.00	.00	.00
20						.00	2.3	.00	.00	.00	.00	.00
21						.00	1.8	.00	.00	.00	.00	.00
22						.00	1.4	.00	.00	.00	.00	.00
23						.10	1.1	.00	.00	.00	.00	.00
24						.50	.83	.00	.00	.00	.00	.00
25						.80	.66	.00	.00	.00	.00	.00
26						1.0	.53	.00	.00	.00	.00	.00
27						1.2	.46	.00	.00	.00	.00	.00
28						1.5	.39	.00	.00	.00	.00	.00
29						2.0	.28	.00	.00	.00	.00	.00
30						2.5	.19	.00	.00	.00	.00	.00
31						5.0	---	.00	---	.00	.00	---
TOTAL						14.60	347.94	0.10	0.00	0.00	0.00	0.00
MEAN						.47	11.6	.003	.00	.00	.00	.00
MAX						5.0	57	.07	.00	.00	.00	.00
MIN						.00	.19	.00	.00	.00	.00	.00
AC-FT						29	690	.2	.0	.0	.0	.0

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
APR											
06...	1025	21	775	7.80	8.5	6.0	290	76	25	34	19
a06...	1026	21	775	7.80	8.5	6.0	280	72	25	33	19
20...	1205	2.1	1140	--	1.5	5.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	0.9	16	150	190	19	0.10	25	481	479	27.3	0.65
a06...	0.9	14	140	210	14	0.20	23	495	475	28.1	0.67

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										
06...	4	170	30	1	22	20	0.1	5	2	250
a06...	4	30	23	<5	22	15	<0.1	4	--	220

a - Split sample analysis for quality assurance.

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 mi^2, 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 good. Stage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 62.02 ft, Apr. 13, 1987; minimum recorded, 57.31 ft, Sept. 18, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 58.25 ft, Apr. 8, 12; minimum recorded, 56.17 ft, Sept. 18.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58.11	58.06	57.92	57.93	57.96	57.95	58.05	57.99	57.57	57.28	56.73	56.55
2	58.13	58.05	57.92	57.93	57.96	57.95	58.08	57.91	57.60	57.29	56.71	56.52
3	58.20	58.02	57.92	57.93	57.96	57.95	58.10	57.79	57.65	57.30	56.68	56.52
4	58.12	57.94	57.92	57.93	57.96	57.95	58.13	57.74	57.67	57.29	56.66	56.49
5	58.01	57.96	57.92	57.92	57.96	57.95	58.14	57.75	57.71	---	56.66	56.50
6	58.08	57.99	57.92	57.92	57.96	57.95	58.17	57.84	57.70	---	56.67	56.47
7	58.14	57.98	57.92	57.93	57.96	57.95	58.19	57.79	57.66	---	56.60	56.40
8	58.11	57.95	57.94	57.95	57.96	57.95	58.17	57.66	57.63	---	56.58	56.35
9	58.04	57.96	57.94	57.96	57.96	57.96	58.12	57.64	57.63	---	56.58	56.35
10	58.12	58.00	57.94	57.96	57.96	57.96	58.18	57.66	57.59	---	56.57	56.31
11	58.11	58.01	57.94	57.96	57.96	57.96	58.22	57.67	57.56	---	56.54	56.29
12	58.13	57.99	57.94	57.96	57.96	57.96	58.22	57.64	57.50	---	56.55	56.32
13	58.11	57.99	57.94	57.96	57.96	57.96	58.17	57.67	57.48	57.07	56.55	56.33
14	58.07	58.02	57.94	57.96	57.96	57.96	58.14	57.65	57.42	57.10	56.56	56.33
15	58.10	58.00	57.94	57.96	57.96	57.96	58.16	57.53	57.41	57.06	56.62	56.30
16	58.09	57.95	57.94	57.96	57.96	57.96	58.17	57.60	57.44	57.05	56.68	56.32
17	58.07	57.94	57.94	57.96	57.96	57.96	58.04	57.70	57.46	57.04	56.86	56.32
18	58.03	57.93	57.94	57.96	57.96	57.96	58.08	57.66	57.45	57.01	56.85	56.26
19	58.02	57.87	57.94	57.96	57.96	57.96	58.08	57.60	57.40	56.99	56.84	56.22
20	57.99	57.89	57.94	57.96	57.96	57.96	58.05	57.57	57.41	56.97	56.83	56.29
21	58.04	57.92	57.94	57.96	57.96	57.96	58.05	57.55	57.42	56.96	56.80	56.30
22	58.07	57.93	57.94	57.96	57.96	57.95	58.04	57.56	57.38	56.96	56.79	56.28
23	58.04	57.93	57.94	57.96	57.96	57.96	58.04	57.56	57.42	56.91	56.73	56.32
24	58.04	57.93	57.94	57.96	57.96	57.97	57.96	57.58	57.36	56.88	56.72	56.29
25	58.07	57.93	57.94	57.96	57.96	57.97	57.88	57.58	57.33	56.88	56.68	56.29
26	57.98	57.93	57.94	57.96	57.95	57.97	57.92	57.52	57.35	56.85	56.67	56.28
27	57.97	57.93	57.93	57.96	57.95	57.97	57.94	57.51	57.36	56.84	56.63	56.27
28	58.00	57.93	57.93	57.96	57.95	57.97	57.95	57.51	57.33	56.83	56.63	56.25
29	58.02	57.93	57.93	57.96	57.95	57.97	57.95	57.59	57.32	56.77	56.62	56.28
30	58.02	57.93	57.93	57.96	---	57.97	57.96	57.61	57.29	56.77	56.56	56.26
31	58.03	---	57.92	57.96	---	58.00	---	57.61	---	56.74	56.56	---
MEAN	58.07	57.96	57.93	57.95	57.96	57.96	58.08	57.65	57.48	---	56.67	56.34
MAX	58.20	58.06	57.94	57.96	57.96	58.00	58.22	57.99	57.71	---	56.86	56.55
MIN	57.97	57.87	57.92	57.92	57.95	57.95	57.88	57.51	57.29	---	56.54	56.22

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND

LOCATION.--Lat 48°19'13", long 98°56'23", in NW1/4SW1/4NW1/4 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 mi^2, of which about 100 mi^2 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: Mar. 23 to Apr. 2. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--8 years (water years 1980-87), 11.1 ft^3/s, 8,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 570 ft^3/s, Apr. 11, 1987, gage height, 8.50 ft; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period March to September, 118 ft^3/s, Apr. 3, gage height, 5.17 ft; maximum gage height, 6.22 ft, Mar. 28, backwater from ice; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	65	.02	1.8	.00	.00	.00
2						.00	80	.02	5.0	.00	.00	.00
3						.00	110	.01	4.4	.00	.00	.00
4						.00	62	.01	16	.00	.00	.00
5						.00	26	.01	26	.97	.00	.00
6						.00	20	.01	23	.13	.00	.00
7						.00	15	.01	14	.14	.00	.00
8						.00	14	.01	7.7	.02	.00	.00
9						.00	13	.01	4.4	.01	.00	.00
10						.00	13	.00	2.5	.01	.00	.00
11						.00	12	.00	1.5	.01	.00	.00
12						.00	10	.00	1.2	1.3	.00	.00
13						.00	8.1	.00	2.2	2.8	.00	.00
14						.00	6.5	.00	4.1	1.1	.00	.00
15						.00	5.3	.00	5.7	1.2	.00	.00
16						.00	4.5	.00	6.3	4.3	.00	.00
17						.00	3.4	.00	6.1	5.1	4.7	.00
18						.00	2.8	.00	5.4	4.4	.02	.00
19						.00	2.4	.00	4.7	2.7	.00	.00
20						.00	1.3	.00	3.5	1.1	.00	.00
21						.00	.92	.00	3.0	.44	.00	.00
22						.00	.57	.00	2.1	.13	.00	.00
23						.25	.37	.00	1.3	.02	.00	.00
24						5.0	.24	.00	.91	.01	.00	.00
25						3.0	.17	.00	.49	.00	.00	.00
26						2.5	.08	.00	.26	.00	.00	.00
27						10	.05	.00	.08	.00	.00	.00
28						20	.04	.00	.01	.00	.00	.00
29						35	.04	.00	.00	.00	.00	.00
30						50	.02	.00	.00	.00	.00	.00
31						60	---	.00	---	.00	.00	---
TOTAL						185.75	476.80	0.11	153.65	25.89	4.72	0.00
MEAN						5.99	15.9	.004	5.12	.84	.15	.00
MAX						60	110	.02	26	5.1	4.7	.00
MIN						.00	.02	.00	.00	.00	.00	.00
AC-FT						368	946	.2	305	51	9.4	.0

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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										
06...	1455	20	595	8.20	14.0	6.0	12.2	101	250	63
20...	1540	0.83	868	8.80	10.0	11.0	13.7	128	390	96
JUN										
02...	0950	5.3	528	7.60	22.5	21.5	7.4	86	210	53
22...	1015	1.9	505	8.00	17.0	22.5	--	--	300	72
JUL										
13...	1445	2.4	250	7.90	29.0	24.5	3.2	39	98	25
AUG										
17...	1310	3.2	890	--	19.0	24.0	--	--	--	--

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)
APR										
06...	22	17	12	0.5	18	176	120	15	0.10	32
20...	37	31	14	0.7	19	260	200	22	0.20	17
JUN										
02...	18	18	15	0.6	13	150	100	15	0.20	20
22...	28	18	11	0.5	15	270	64	15	0.20	26
JUL										
13...	8.5	8.5	15	0.4	6.8	100	33	5.6	0.20	14

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
06...	387	404	0.53	21.4	41	0.260	0.110	2.26	0.780	6
20...	618	576	0.84	1.38	8	0.050	0.010	0.010	0.260	6
JUN										
02...	327	346	0.44	4.70	1	0.110	0.540	4.36	0.750	7
22...	424	403	0.58	2.15	8	0.110	0.010	0.060	1.40	8
JUL										
13...	171	170	0.23	1.13	472	0.180	0.200	0.900	0.870	5

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									
06...	130	40	<1	21	20	0.1	4	2	260
20...	120	30	<1	31	10	0.4	5	2	340
JUN									
02...	100	30	<1	20	10	0.6	3	1	270
22...	30	20	1	20	30	0.2	3	<1	340
JUL									
13...	50	270	<1	10	30	0.3	3	<1	180

05056241 DRY LAKE NEAR PENN, ND

LOCATION.--Lat 48°13'52", long 98°58'59", in NW¼NW¼SW¼ 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.--Records poor. Stage affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 50.32 ft, Apr. 20, 1987, affected by wind; minimum recorded, 44.11 ft, July 3, 1986, affected by wind.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 46.53 ft, Oct. 1, affected by wind; minimum recorded, 44.11 ft, July 31; minimum gage height for year probably occurred in late September during period of missing record.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45.94	45.29	45.23	---	---	---	---	45.18	---	44.59	44.39	---
2	45.69	45.38	45.24	---	---	---	---	45.22	45.12	44.59	44.33	---
3	45.59	45.34	45.26	---	---	---	---	45.42	45.14	44.51	44.31	---
4	45.68	45.39	45.25	---	---	---	---	45.43	45.06	44.65	---	---
5	45.84	45.32	45.25	---	---	---	---	45.38	44.97	44.67	---	---
6	45.68	45.32	45.25	---	---	---	---	45.29	44.96	44.69	---	---
7	45.64	45.37	45.26	---	---	---	---	45.43	45.02	44.68	---	---
8	45.67	45.35	45.28	---	---	---	---	45.61	45.07	44.60	---	---
9	45.70	45.30	45.28	---	---	---	---	45.43	44.92	44.69	---	---
10	45.56	45.28	45.28	---	---	---	---	45.42	44.87	44.65	---	---
11	45.54	45.28	45.29	---	---	---	---	45.37	44.88	44.57	---	---
12	45.54	45.29	45.28	---	---	---	---	---	44.98	44.52	---	---
13	45.56	45.28	45.28	---	---	---	---	---	45.00	44.68	---	---
14	45.53	45.17	45.28	---	---	---	---	---	45.02	44.67	---	---
15	45.52	45.31	45.27	---	---	---	---	---	44.94	44.72	---	---
16	45.54	45.34	---	---	---	---	---	---	44.87	44.63	---	---
17	45.46	45.31	---	---	---	---	---	---	44.78	44.62	44.37	---
18	45.48	45.27	---	---	---	---	---	45.33	44.86	44.61	---	---
19	45.49	45.27	---	---	---	---	---	45.34	44.90	44.59	---	---
20	45.50	45.25	---	---	---	---	---	45.34	44.75	44.60	---	---
21	45.39	45.25	---	---	---	---	---	---	44.89	44.56	---	---
22	45.45	45.25	---	---	---	---	45.44	45.20	44.86	44.48	---	---
23	45.45	45.25	---	---	---	---	45.39	45.20	44.68	44.54	---	---
24	45.37	45.24	---	---	---	---	45.32	45.20	44.85	44.54	---	---
25	45.38	45.24	---	---	---	---	45.46	45.06	44.84	44.43	---	---
26	45.46	45.24	---	---	---	---	45.39	45.05	44.74	44.47	---	---
27	45.42	45.24	---	---	---	---	45.37	45.06	44.61	44.46	---	---
28	45.38	45.24	---	---	---	---	45.33	45.03	44.83	44.38	---	---
29	45.38	45.23	---	---	---	---	45.30	44.98	44.67	44.58	---	---
30	45.38	45.23	---	---	---	---	45.25	---	44.64	44.35	---	---
31	45.32	---	---	---	---	---	---	---	---	44.42	---	---
MEAN	45.53	45.28	---	---	---	---	---	---	---	44.57	---	---
MAX	45.94	45.39	---	---	---	---	---	---	---	44.72	---	---
MIN	45.32	45.17	---	---	---	---	---	---	---	44.35	---	---

05056247 CALIO COULEE NEAR STARKWEATHER, ND

LOCATION.--Lat 48°23'58", long 99°02'46", in NW1/4 sec.28, T.157 N., R.65 W., Towner County, Hydrologic Unit 09020201, on left bank on downstream side of bridge 6 mi southwest of Starkweather.

DRAINAGE AREA.--130 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to September 1988 (discontinued).

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

REMARKS.--Estimated daily discharges: Mar. 8-31 and Apr. 11-19. Records poor.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 19 ft3/s, Mar. 10, gage height, 52.32 ft, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	9.6	.00	.00	.00	.00	.00
2						.00	11	.00	.00	.00	.00	.00
3						.00	11	.00	.00	.00	.00	.00
4						.00	11	.00	.00	.00	.00	.00
5						.00	9.2	.00	.00	.00	.00	.00
6						.00	5.2	.00	.00	.00	.00	.00
7						.00	2.7	.00	.00	.00	.00	.00
8						.30	1.7	.00	.00	.00	.00	.00
9						2.0	.95	.00	.00	.00	.00	.00
10						19	.68	.00	.00	.00	.00	.00
11						10	.50	.00	.00	.00	.00	.00
12						2.5	.40	.00	.00	.00	.00	.00
13						2.0	.32	.00	.00	.00	.00	.00
14						1.9	.25	.00	.00	.00	.00	.00
15						1.9	.12	.00	.00	.00	.00	.00
16						4.0	.06	.00	.00	.00	.00	.00
17						7.2	.04	.00	.00	.00	.00	.00
18						6.5	.02	.00	.00	.00	.00	.00
19						7.2	.00	.00	.00	.00	.00	.00
20						5.0	.00	.00	.00	.00	.00	.00
21						7.0	.00	.00	.00	.00	.00	.00
22						9.4	.00	.00	.00	.00	.00	.00
23						12	.00	.00	.00	.00	.00	.00
24						10	.00	.00	.00	.00	.00	.00
25						8.8	.00	.00	.00	.00	.00	.00
26						8.0	.00	.00	.00	.00	.00	.00
27						11	.00	.00	.00	.00	.00	.00
28						13	.00	.00	.00	.00	.00	.00
29						12	.00	.00	.00	.00	.00	.00
30						10	.00	.00	.00	.00	.00	.00
31						8.6	---	.00	---	.00	.00	---
TOTAL						179.30	64.74	0.00	0.00	0.00	0.00	0.00
MEAN						5.78	2.16	.00	.00	.00	.00	.00
MAX						19	11	.00	.00	.00	.00	.00
MIN						.00	.00	.00	.00	.00	.00	.00
AC-FT						356	128	.0	.0	.0	.0	

05056247 CALIO COULEE NEAR STARKWEATHER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1987 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR 10...	1715	19	930	--	3.0	0.0	--	--	--	--	--
APR 06...	1045	5.2	558	7.97	9.0	5.0	270	63	27	21	14

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 06...	0.6	11	190	120	11	0.10	32	410	398	5.72	0.56

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 06...	5	150	30	1	21	10	0.3	3	2	220

05056390 LITTLE COULEE NEAR BRINSMADE, ND

LOCATION.--Lat 48°11'15", long 99°14'34", in SW1/4 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 mi^2, of which about 160 mi^2 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 good.

AVERAGE DISCHARGE.--7 years (water years 1976-82), 7.02 ft^3/s, 5,090 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 425 ft^3/s, May 1, 1979, gage height, 10.43 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 6.93 ft, Mar. 23; no flow March 1 to Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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						.00	.00	.00	.00	.00	.00	.00
MAX						.00	.00	.00	.00	.00	.00	.00
MIN						.00	.00	.00	.00	.00	.00	.00
AC-FT						.0	.0	.0	.0	.0	.0	.0

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 right 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 mi^2, approximately, of which about 158 mi^2 is probably noncontributing (revised). Drainage area reduced from approximately 2,510 mi^2 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.--Estimated daily discharges: Nov. 18 to Apr. 4 and May 6-31. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--10 years (water years 1979-88), 44.4 ft^3/s, 32,170 acre-ft/yr; median of yearly mean discharges, 17 ft^3/s, 12,300 acre-ft/yr. Twenty-eight years prior to construction of Channel A (water years 1951-78), 37.3 ft^3/s, 27,020 acre-ft/yr; median of yearly mean discharges (1951-78), 7.8 ft^3/s, 5,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,420 ft^3/s, May 6, 1979, gage height, 7.59 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25 ft^3/s, Apr. 17, gage height, 1.63 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.09	3.6	.07	.00	1.8	4.0	3.4	.04	.00	.00	.00
2	.09	.09	2.5	.06	.00	1.2	4.5	2.7	.04	.00	.00	.00
3	.32	.11	2.0	.05	.00	1.0	5.0	3.0	.04	.00	.00	.00
4	.15	.19	1.8	.04	.00	1.7	6.5	6.6	.04	.00	.00	.00
5	.07	.13	1.6	.03	.00	3.0	12	6.4	.04	.00	.00	.00
6	.06	.10	1.4	.02	.00	5.0	12	5.1	.04	.02	.00	.00
7	.09	.09	1.2	.02	.00	4.0	12	2.8	.02	.00	.00	.00
8	.09	.08	1.1	.02	.00	3.0	10	4.4	.00	.01	.00	.00
9	.07	.07	1.1	.01	.00	3.0	16	9.6	.00	.00	.00	.00
10	.06	.07	1.0	.01	.00	3.0	14	3.7	.00	.00	.00	.00
11	.06	.09	1.0	.00	.00	2.0	11	2.3	.00	.00	.00	.00
12	.06	.11	.90	.00	.00	.70	7.3	1.8	.00	.00	.00	.00
13	.09	.11	.80	.00	.00	.20	11	4.0	.00	.04	.00	.00
14	.11	5.1	.70	.00	.00	.00	16	.94	.00	.03	.00	.00
15	.11	8.8	.62	.00	.00	.00	14	.44	.00	.00	.00	.00
16	.13	12	.55	.00	.00	.00	10	.50	.00	.00	.00	.00
17	.14	9.0	.50	.00	.00	.00	15	.45	.00	.00	.00	.00
18	.18	6.5	.45	.00	.00	.00	18	.40	.00	.00	.00	.00
19	.19	6.0	.37	.00	.00	.00	11	.45	.00	.00	.00	.00
20	12	5.5	.33	.00	.00	.00	13	.45	.00	.00	.00	.00
21	8.7	4.0	.28	.00	.00	.00	11	.40	.00	.00	.00	.00
22	.73	4.0	.26	.00	.00	.00	11	.35	.00	.00	.00	.00
23	.28	4.0	.24	.00	.00	.00	10	.30	.00	.00	.00	.00
24	.23	3.9	.22	.00	.00	.00	7.2	.25	.00	.00	.00	.00
25	.15	3.9	.20	.00	.00	.00	11	.20	.00	.00	.00	.00
26	.11	3.8	.18	.00	.00	.10	11	.15	.00	.00	.00	.00
27	.09	3.8	.16	.00	.00	.20	7.9	.20	.00	.00	.00	.00
28	.09	3.8	.14	.00	.02	.50	6.7	.20	.00	.00	.00	.00
29	.09	3.8	.12	.00	1.0	1.0	5.6	.40	.00	.00	.00	.00
30	.09	3.7	.10	.00	---	2.5	4.1	.20	.00	.00	.00	.00
31	.09	---	.08	.00	---	3.0	---	.10	---	.00	.00	---
TOTAL	24.90	92.93	25.50	0.33	1.02	36.90	307.8	62.18	0.26	0.10	0.00	0.00
MEAN	.80	3.10	.82	.011	.035	1.19	10.3	2.01	.009	.003	.00	.00
MAX	12	12	3.6	.07	1.0	5.0	18	9.6	.04	.04	.00	.00
MIN	.06	.07	.08	.00	.00	.00	4.0	.10	.00	.00	.00	.00
AC-FT	49	184	51	.7	2.0	73	611	123	.5	.2	.0	.0

CAL YR 1987 TOTAL 23932.78 MEAN 65.6 MAX 472 MIN .00 AC-FT 47470
WTR YR 1988 TOTAL 551.92 MEAN 1.51 MAX 18 MIN .00 AC-FT 1090

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1958, 1961 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT										
06...	1305	0.06	1370	7.20	10.5	7.5	8.2	69	--	--
NOV										
17...	0940	6.6	1290	7.60	-4.0	1.0	11.1	79	--	--
JAN										
07...	1155	0.02	970	--	-9.5	0.0	--	--	--	--
MAR										
01...	1108	1.8	955	--	1.0	0.5	--	--	--	--
APR										
07...	0900	13	960	8.40	8.5	7.5	9.9	85	330	62
21...	1010	11	1060	8.90	2.5	4.5	11.8	93	370	66
JUN										
01...	1500	0.04	1380	8.40	22.5	24.5	3.4	42	520	89

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)
APR										
07...	43	70	30	2	21	239	220	34	0.10	14
21...	50	74	29	2	22	260	260	34	0.10	12
JUN										
01...	71	160	39	3	30	350	470	63	0.20	22

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
07...	621	608	0.84	21.1	17	0.080	0.030	0.050	0.660	4
21...	683	673	0.93	20.8	44	0.060	0.010	0.020	0.460	4
JUN										
01...	1170	1120	1.59	0.13	66	0.040	0.020	0.030	1.31	12

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									
07...	190	30	<1	58	180	0.4	2	2	300
21...	180	120	<1	65	50	0.4	2	3	320
JUN									
01...	290	50	<1	120	850	0.1	3	1	560

05056403 COMSTOCK COULEE NEAR MINNEWAUKAN, ND

LOCATION.--Lat 48°06'33", long 99°13'35", in SE¼SE¼ sec.29, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, at bridge on U.S. Highway 281, 2.8 mi north of Minnewauken.

DRAINAGE AREA.--58 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to September 30, 1988 (Discontinued).

GAGE.--Wire-weight gage. Daily wire-weight readings are obtained by observer during periods of flow. Datum of gage is 1,410.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 20. Records poor.

EXTREMES FOR CURRENT PERIOD.--Maximum observed discharge, 0.24 ft^3/s, Mar. 24, gage height, 23.54 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	.01	.00	.00	.00	.00	.00
2						.00	.02	.00	.00	.00	.00	.00
3						.00	.02	.00	.00	.00	.00	.00
4						.00	.02	.00	.00	.00	.00	.00
5						.00	.01	.00	.00	.00	.00	.00
6						.00	.01	.00	.00	.00	.00	.00
7						.00	.01	.00	.00	.00	.00	.00
8						.00	.01	.00	.00	.00	.00	.00
9						.00	.01	.00	.00	.00	.00	.00
10						.01	.01	.00	.00	.00	.00	.00
11						.00	.01	.00	.00	.00	.00	.00
12						.00	.01	.00	.00	.00	.00	.00
13						.00	.01	.00	.00	.00	.00	.00
14						.00	.01	.00	.00	.00	.00	.00
15						.00	.01	.00	.00	.00	.00	.00
16						.00	.01	.00	.00	.00	.00	.00
17						.00	.01	.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						.24	.00	.00	.00	.00	.00	.00
25						.09	.00	.00	.00	.00	.00	.00
26						.02	.00	.00	.00	.00	.00	.00
27						.02	.00	.00	.00	.00	.00	.00
28						.03	.00	.00	.00	.00	.00	.00
29						.02	.00	.00	.00	.00	.00	.00
30						.01	.00	.00	.00	.00	.00	.00
31						.01	---	.00	---	.00	.00	---
TOTAL						0.45	0.20	0.00	0.00	0.00	0.00	0.00
MEAN						.015	.007	.00	.00	.00	.00	.00
MAX						.24	.02	.00	.00	.00	.00	.00
MIN						.00	.00	.00	.00	.00	.00	.00
AC-FT						.9	.4	.0	.0	.0	.0	.0

05056410 CHANNEL A NEAR PENN, ND

LOCATION.--Lat 48°10'00", long 98°58'47", in SE¼SW¼SW¼ sec.11, T.154 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on west bank of Channel A between Highway 2 and the Railroad bridge and 6.8 mi southeast of Penn on Highway 2, or 8.9 mi northwest of Devils Lake on Highway 2.

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. 8-28, Nov. 16 to Apr. 4, July 2-11, and Aug. 27 to Sept. 30. Records poor. Flow variable due to wind effect on Dry Lake (station 05056241). Flow regulated by gate control on Dry Lake 3.0 mi upstream.

AVERAGE DISCHARGE.--5 years (water years 1984-1988), 27.1 ft^3/s, 19,600 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, 93 ft^3/s, Apr. 17, gage height, 39.08 ft; no flow for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	2.8	.24	.01	.00	1.0	8.0	.23	.11	.00	.00	.01
2	.57	6.4	.20	.01	.00	.10	8.5	.41	.28	.00	.00	.01
3	.57	9.5	.18	.01	.00	.02	10	.64	.49	.00	.00	.01
4	.80	23	.16	.01	.00	.20	15	1.2	.46	.00	.00	.01
5	.81	9.3	.14	.01	.00	.25	27	1.2	.29	.00	.00	.01
6	.81	6.8	.12	.01	.00	.50	23	.83	.20	.00	.00	.01
7	1.0	9.4	.10	.01	.00	.25	15	.42	.05	.00	.00	.01
8	15	16	.09	.01	.00	.20	18	.56	.04	.00	.00	.01
9	30	7.6	.08	.01	.00	.25	42	1.2	.01	.00	.00	.01
10	33	6.6	.07	.01	.00	.10	21	.89	.01	.00	.00	.01
11	36	6.8	.06	.01	.00	.00	13	.57	.01	.00	.00	.01
12	38	7.4	.05	.01	.00	.00	18	.66	.01	.00	.00	.01
13	40	7.9	.04	.01	.00	.00	34	.79	.01	.00	.00	.01
14	37	3.1	.03	.01	.00	.00	30	.41	.01	.00	.00	.01
15	34	5.8	.02	.01	.00	.00	21	.92	.01	.00	.00	.01
16	31	4.0	.01	.01	.00	.00	15	.97	.01	.00	.00	.01
17	27	2.7	.01	.01	.00	.00	65	.33	.01	.00	.45	.01
18	23	2.2	.01	.01	.00	.00	22	.22	.01	.00	.01	.01
19	20	1.7	.01	.01	.00	.00	22	.39	.01	.00	.01	.01
20	18	1.3	.01	.01	.00	.00	30	.57	.01	.00	.01	.01
21	16	1.1	.01	.01	.00	2.0	20	.47	.01	.00	.01	.01
22	15	.90	.01	.01	.00	4.5	21	.52	.01	.00	.01	.01
23	14	.78	.01	.01	.00	6.0	19	.34	.01	.00	.01	.01
24	13	.66	.01	.00	.00	4.0	17	.39	.00	.00	.01	.01
25	12	.55	.01	.00	.00	2.5	44	.30	.00	.00	.01	.01
26	12	.48	.01	.00	.00	4.0	21	.30	.00	.00	.01	.01
27	12	.41	.01	.00	.00	4.0	12	.39	.00	.00	.01	.01
28	11	.36	.01	.00	.10	4.0	1.3	.39	.00	.00	.01	.01
29	11	.31	.01	.00	.50	4.5	.80	.39	.00	.00	.01	.01
30	11	.27	.01	.00	---	7.0	.46	.24	.00	.00	.01	.01
31	4.6	---	.01	.00	---	8.5	---	.13	---	.00	.01	---
TOTAL	518.73	146.12	1.74	0.23	0.60	53.87	614.06	17.27	2.07	0.00	0.59	0.30
MEAN	16.7	4.87	.056	.007	.021	1.74	20.5	.56	.069	.00	.019	.010
MAX	40	23	.24	.01	.50	8.5	65	1.2	.49	.00	.45	.01
MIN	.57	.27	.01	.00	.00	.00	.46	.13	.00	.00	.00	.01
AC-FT	1030	290	3.5	.5	1.2	107	1220	34	4.1	.0	1.2	.6

CAL YR 1987 TOTAL 31735.61 MEAN 86.9 MAX 1050 MIN .00 AC-FT 62950
WTR YR 1988 TOTAL 1355.58 MEAN 3.70 MAX 65 MIN .00 AC-FT 2690

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT										
07...	1055	0.74	1190	7.80	7.0	7.5	6.2	52	--	--
NOV										
17...	1240	2.7	925	7.70	1.0	1.0	12.1	86	--	--
JAN										
07...	1600	0.01	1200	--	-12.5	0.0	--	--	--	--
MAR										
01...	1635	1.5	890	--	-3.0	0.5	--	--	--	--
23...	1620	5.6	795	7.30	5.5	1.0	13.0	94	230	52
APR										
07...	1415	15	772	8.60	21.0	11.5	8.8	83	240	45
a07...	1416	15	772	8.60	21.0	11.5	8.8	83	240	46
22...	1140	19	950	8.90	4.5	5.0	8.0	64	310	61
JUN										
03...	0820	0.42	1480	8.00	21.0	23.0	3.4	40	440	75
a03...	0821	0.42	1480	8.00	21.0	23.0	3.4	40	430	72
AUG										
17...	0855	1.2	1990	--	19.0	20.0	--	--	--	--

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)
MAR										
23...	25	69	37	2	15	150	230	20	0.10	14
APR										
07...	31	64	35	2	19	220	150	26	0.10	8.0
a07...	31	64	35	2	15	208	160	22	0.20	5.7
22...	38	79	34	2	21	290	180	28	0.20	19
JUN										
03...	61	160	43	3	25	340	400	41	0.20	8.1
a03...	60	150	42	3	25	343	400	39	0.40	7.4

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
MAR										
23...	523	522	0.71	7.89	28	0.500	0.040	0.590	0.800	5
APR										
07...	470	476	0.64	19.7	20	0.060	0.010	<0.010	0.300	4
a07...	485	469	0.66	20.3	--	0.050	<0.010	--	0.080	3
22...	626	599	0.85	32.6	191	0.100	<0.010	0.110	0.430	5
JUN										
03...	996	978	1.35	1.13	14	0.100	0.020	0.040	0.460	11
a03...	986	962	1.34	1.12	--	0.470	0.030	0.100	0.170	11

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)
MAR									
23...	120	150	<1	50	640	<0.1	3	1	310
APR									
07...	160	30	<1	43	90	0.2	2	2	260
a07...	70	37	<5	44	100	<0.1	2	<1	200
22...	170	50	<1	51	10	0.2	4	3	310
JUN									
03...	260	20	<1	100	330	0.1	3	1	570
a03...	250	14	<5	100	310	<0.1	5	<1	430

a - Split sample analysis for quality assurance.

05056500 DEVILS LAKE NEAR DEVILS LAKE, ND

LOCATION.--Lat 48°04'00", long 98°56'07", in SW1/4 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, 1,428.37 ft, Oct. 1; minimum, 1,426.11 ft, Sept. 10.

MONTHEND ELEVATION, IN FEET, AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Oct. 31.....	1,427.97	Jan. 31.....	---	Apr. 30.....	1,427.84	July 31..... 1,427.01
Nov. 30.....	1,427.87	Feb. 29.....	1427.88	May 31.....	1,427.70	Aug. 31..... 1,426.53
Dec. 31.....	---	Mar. 31.....	1427.89	June 30.....	1,427.29	Sept.30..... 1,426.21

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28.30	27.97	27.88	---	---	27.89	27.89	27.81	27.73	27.28	26.97	26.55
2	28.23	27.99	27.87	---	27.88	27.89	27.89	27.81	27.78	27.25	26.99	26.52
3	28.21	27.99	27.90	---	27.88	27.89	27.89	27.85	27.78	27.24	27.01	26.50
4	28.30	28.03	27.89	---	27.88	27.89	27.89	27.84	27.77	27.22	26.97	26.47
5	28.23	27.97	27.88	---	27.89	27.89	27.89	27.84	27.74	27.33	26.97	26.46
6	28.17	27.97	27.88	---	27.89	27.89	27.89	27.78	27.71	27.54	26.94	26.45
7	28.17	27.96	27.90	---	27.89	27.89	27.89	27.80	27.68	27.61	26.95	26.46
8	28.19	27.94	27.94	---	27.89	27.89	27.89	27.82	27.63	27.52	26.89	26.49
9	28.12	27.94	27.93	---	27.89	27.89	27.89	27.85	27.61	27.51	26.88	26.37
10	28.12	27.94	27.92	---	27.89	27.89	27.89	27.82	27.58	27.46	26.87	26.25
11	28.10	27.95	27.92	---	27.89	27.89	27.89	27.83	27.57	27.43	26.85	26.27
12	28.11	27.95	27.92	---	27.90	27.89	27.89	27.82	27.54	27.38	26.84	26.33
13	28.11	27.94	27.92	---	27.89	27.89	27.89	27.83	27.54	27.40	26.85	26.31
14	28.08	27.91	27.91	---	27.88	27.89	27.89	27.84	27.53	27.29	26.85	26.30
15	28.05	27.95	27.91	---	27.88	27.89	27.88	27.85	27.52	27.31	26.87	26.29
16	28.07	27.93	27.91	---	27.88	27.89	27.88	27.77	27.50	27.30	26.86	26.29
17	28.08	27.92	27.90	---	27.88	27.89	27.88	27.75	27.49	27.28	26.85	26.32
18	28.07	27.94	27.90	---	27.88	27.89	27.88	27.77	27.47	27.27	26.85	26.26
19	28.03	27.91	27.91	---	27.88	27.89	27.88	27.77	27.48	27.26	26.83	26.30
20	28.02	27.87	27.91	---	27.88	27.89	27.88	27.77	27.45	27.22	26.81	26.27
21	27.98	27.90	27.90	---	27.88	27.89	27.88	27.76	27.46	27.22	26.80	26.25
22	27.99	27.89	27.89	---	27.88	27.89	27.88	27.75	27.47	27.22	26.81	26.30
23	28.01	27.88	27.91	---	27.88	27.89	27.88	27.75	27.44	27.19	26.77	26.25
24	27.98	27.87	27.91	---	27.88	27.89	27.88	27.72	27.46	27.14	26.70	26.26
25	28.00	27.89	27.89	---	27.88	27.91	27.88	27.74	27.41	27.14	26.66	26.20
26	28.06	27.88	27.91	---	27.88	27.90	27.88	27.69	27.38	27.12	26.65	26.25
27	28.00	27.89	27.91	---	27.88	27.90	27.88	27.71	27.37	27.10	26.63	26.18
28	28.00	27.88	27.91	---	27.88	27.90	27.87	27.71	27.33	27.10	26.57	26.15
29	28.00	27.88	27.91	---	27.88	27.90	27.85	27.70	27.28	27.08	26.56	26.18
30	27.97	27.87	27.91	---	---	27.89	27.84	27.71	27.29	27.05	26.55	26.21
31	27.99	---	---	---	---	27.89	---	27.71	---	27.04	26.56	---
MEAN	28.09	27.93	---	---	---	27.89	27.88	27.78	27.53	27.27	26.81	26.32
MAX	28.30	28.03	---	---	---	27.91	27.89	27.85	27.78	27.61	27.01	26.55
MIN	27.97	27.87	---	---	---	27.89	27.84	27.69	27.28	27.04	26.55	26.15

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND

LOCATION.--Lat 47°25'58", long 98°01'38", in NW¼NW¼SW¼ sec.26, T.146 N., R.58 W., Griggs County, Hydrologic Unit 09020203, on right bank 150 ft upstream from county bridge, 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. Datum of gage is 1,271.76 ft above National Geodetic Vertical Datum of 1929, Coast and Geodetic Survey benchmark. Prior to Oct. 22, 1985, gage located on right bank 300 ft downstream of present site. Datum of gage was 1,271.76 ft. Prior to Aug. 3, 1950, nonrecording gage at site 150 ft downstream of present site at same datum.

REMARKS.--Estimated daily discharges: Dec. 5 to Mar. 7. Records fair.

AVERAGE DISCHARGE.--44 years, 109 ft^3/s, 78,970 acre-ft/yr; median of yearly mean discharges, 86 ft^3/s, 62,300 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)
Mar. 10	2159	251	10.59	Apr. 5	1230	*389	*10.96

Minimum daily discharge, 0.21 ft^3/s, Sept. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	53	50	23	16	25	278	69	47	17	15	.65
2	52	53	48	20	16	25	312	70	43	16	15	.34
3	52	53	46	18	16	35	332	70	39	14	15	.21
4	53	57	45	17	16	45	365	68	36	14	13	.40
5	53	60	45	15	16	55	382	67	34	13	13	.67
6	50	59	45	14	16	85	329	65	32	15	12	.48
7	50	58	46	14	16	105	292	66	30	15	10	.97
8	50	56	48	14	16	150	261	72	28	13	9.1	1.6
9	49	53	50	14	15	188	238	75	25	13	8.4	.68
10	50	45	50	14	14	222	220	82	24	13	8.4	.85
11	52	50	51	14	14	243	204	84	24	26	8.6	1.0
12	53	55	51	14	14	202	194	86	27	38	9.1	1.4
13	52	56	50	14	14	186	186	84	32	43	9.3	1.3
14	55	56	49	15	14	168	175	79	34	42	9.6	.89
15	56	56	47	16	15	143	168	75	33	57	18	1.3
16	56	56	46	18	16	136	160	75	31	73	23	1.5
17	54	56	45	18	18	141	148	75	29	58	12	2.1
18	53	51	45	17	19	138	135	74	28	42	8.6	3.2
19	53	42	44	17	20	138	124	85	29	32	8.4	2.5
20	53	40	44	17	19	126	116	92	29	30	8.2	2.2
21	52	48	44	17	21	122	109	87	29	24	5.5	4.7
22	51	53	44	17	21	126	101	82	26	20	4.1	4.7
23	50	52	40	17	20	147	96	82	27	17	2.4	2.5
24	50	52	38	17	19	206	91	79	30	15	1.9	3.1
25	50	53	36	16	19	241	87	70	28	14	1.3	2.4
26	51	53	36	16	20	235	82	63	25	13	.52	5.0
27	54	52	34	16	21	232	80	57	23	14	.29	2.0
28	54	52	32	17	23	228	77	53	21	15	1.9	1.4
29	54	52	30	19	25	221	75	51	19	14	5.7	1.5
30	53	51	28	19	---	231	73	53	17	12	2.2	3.0
31	53	---	26	17	---	248	---	51	---	11	1.3	---
TOTAL	1621	1583	1333	511	509	4793	5490	2241	879	753	260.81	54.54
MEAN	52.3	52.8	43.0	16.5	17.6	155	183	72.3	29.3	24.3	8.41	1.82
MAX	56	60	51	23	25	248	382	92	47	73	23	5.0
MIN	49	40	26	14	14	25	73	51	17	11	.29	.21
AC-FT	3220	3140	2640	1010	1010	9510	10890	4450	1740	1490	517	108

CAL YR 1987	TOTAL	84343	MEAN 231	MAX 4660	MIN 20	AC-FT	167300
WTR YR 1988	TOTAL	20028.35	MEAN 54.7	MAX 382	MIN .21	AC-FT	39730

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
01...	1030	54	620	--	16.5	13.0	--	--	--	--	--
NOV											
16...	1320	54	--	--	1.0	2.0	--	--	--	--	--
JAN											
12...	1015	20	1340	--	-19.5	0.5	--	--	--	--	--
FEB											
17...	1350	18	880	--	0.0	0.0	--	--	--	--	--
APR											
08...	1140	260	628	8.50	12.0	8.5	220	50	24	44	29
MAY											
24...	1140	77	1000	--	23.5	19.5	--	--	--	--	--
JUN											
29...	1230	19	895	8.10	20.5	23.0	310	69	33	75	34
AUG											
18...	1015	7.7	845	--	22.0	22.0	--	--	--	--	--
SEP											
15...	0940	0.94	805	--	14.0	16.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	1	8.0	211	110	12	0.20	24	380	399	267	0.52
JUN											
29...	2	9.6	330	130	39	0.30	31	586	595	29.4	0.80

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										
08...	3	170	30	1	37	100	0.1	1	2	270
JUN										
29...	8	140	20	<1	60	1200	0.4	2	1	450

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 mi^2, of which about 340 mi^2 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 Apr. 3. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--32 years, 16.1 ft^3/s, 11,660 acre-ft/yr; median of yearly mean discharges, 12 ft^3/s, 8,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 9,000 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft3/s)	Gage height (ft)
Mar. 28	----	*115	a*5.80				

Minimum daily discharge, 0.02 ft^3/s, July 30 and 31.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	6.5	4.2	1.9	1.3	10	66	11	5.0	.45	.04	.13
2	3.1	6.5	4.2	1.8	1.2	6.0	60	11	4.9	.36	.22	.10
3	2.9	6.5	4.2	1.7	1.2	8.0	55	12	3.8	.36	.33	.08
4	4.0	6.5	4.2	1.3	1.1	8.5	43	11	3.1	.36	1.0	.07
5	5.6	6.4	4.2	1.1	1.1	9.0	39	11	2.5	.46	1.2	.07
6	6.2	6.4	4.1	.85	1.1	14	36	9.1	2.2	.50	1.1	.06
7	6.3	6.4	4.1	.80	1.1	13	33	10	2.1	.37	.86	.06
8	6.5	6.4	4.1	.75	1.0	15	31	13	1.9	.34	.70	.06
9	6.5	6.4	4.1	.70	.95	18	29	12	1.6	.54	.63	.05
10	6.5	6.4	4.2	.65	.90	20	27	11	1.4	.42	.58	.04
11	6.7	6.4	4.2	.60	.80	45	25	11	1.3	.17	.58	.04
12	6.7	6.4	4.0	.60	1.0	40	25	12	1.5	.09	1.1	.04
13	6.7	6.4	3.8	.60	1.0	40	23	11	2.0	.22	1.2	.04
14	6.8	6.4	3.8	.65	1.1	40	21	10	2.5	.90	1.5	.04
15	6.8	6.4	3.8	.70	1.1	43	20	11	2.6	1.2	1.6	.04
16	6.8	6.4	3.7	1.0	1.1	44	19	9.6	2.4	.91	1.5	.19
17	6.8	6.2	3.4	1.0	1.1	46	19	8.5	2.1	.75	1.3	.20
18	6.8	6.2	3.4	1.0	1.2	47	18	9.0	1.8	.62	1.0	.50
19	6.7	5.8	3.2	1.0	1.3	46	20	17	1.8	.54	.93	4.6
20	6.7	4.3	3.1	1.0	1.3	44	18	14	1.5	.47	.84	3.2
21	6.7	4.4	3.0	1.1	1.3	43	17	11	1.3	.32	.65	2.3
22	6.7	4.4	3.0	1.2	1.5	44	16	10	1.2	.17	.56	1.2
23	6.7	4.4	3.0	1.1	1.4	45	15	9.7	1.1	.09	.53	.67
24	6.7	4.4	2.9	1.1	1.4	50	14	8.3	1.1	.07	.27	.40
25	6.6	4.4	2.6	1.0	1.4	65	14	6.7	1.2	.06	.09	.14
26	6.6	4.3	2.3	1.0	1.6	75	14	6.4	1.2	.05	.08	.11
27	6.6	4.3	2.2	1.0	2.3	90	12	6.7	1.1	.04	.07	.18
28	6.6	4.3	2.2	1.2	5.0	100	12	5.7	.85	.03	.08	.98
29	6.6	4.3	2.1	1.5	11	75	11	4.8	.60	.03	.09	.64
30	6.5	4.2	2.1	1.4	---	74	12	4.1	.54	.02	.12	.24
31	6.5	---	2.0	1.3	---	65	---	3.9	---	.02	.10	---
TOTAL	191.9	168.7	105.4	32.60	48.85	1282.5	764	301.5	58.19	10.93	20.85	16.47
MEAN	6.19	5.62	3.40	1.05	1.68	41.4	25.5	9.73	1.94	.35	.67	.55
MAX	6.8	6.5	4.2	1.9	11	100	66	17	5.0	1.2	1.6	4.6
MIN	2.9	4.2	2.0	.60	.80	6.0	11	3.9	.54	.02	.04	.04
AC-FT	381	335	209	65	97	2540	1520	598	115	22	41	33

CAL YR 1987 TOTAL 18458.9 MEAN 50.6 MAX 905 MIN 1.4 AC-FT 36610
WTR YR 1988 TOTAL 3001.89 MEAN 8.20 MAX 100 MIN .02 AC-FT 5950

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
01...	1200	3.2	555	--	15.0	14.0	--	--	--	--	--
NOV											
16...	1440	6.3	930	--	2.5	4.0	--	--	--	--	--
JAN											
11...	1325	0.60	1510	--	-13.5	1.0	--	--	--	--	--
FEB											
18...	1240	1.2	905	--	2.0	1.0	--	--	--	--	--
MAR											
30...	1045	71	675	7.70	2.0	1.0	250	55	28	36	22
APR											
13...	1110	23	840	--	10.0	10.0	--	--	--	--	--
MAY											
26...	1405	6.5	1140	--	25.5	20.0	--	--	--	--	--
JUL											
06...	1025	0.54	1200	8.40	33.0	27.0	330	38	57	130	45
15...	1025	1.3	1120	--	25.5	22.5	--	--	--	--	--
AUG											
03...	0940	0.27	1190	--	23.0	23.0	--	--	--	--	--
18...	0940	0.95	975	--	25.0	24.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	1	16	181	150	13	0.10	22	424	429	80.8	0.58
JUL											
06...	3	15	280	300	37	0.30	4.3	769	751	1.12	1.05

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)
MAR										
30...	2	170	90	<1	36	90	0.1	2	2	310
JUL										
06...	5	230	40	<1	110	220	0.1	1	<1	480

05057500 LAKE ASHTABULA AT BALDHILL DAM, ND

LOCATION.--Lat 47°02'00", long 98°05'00", in NW1/4 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 mi^2, approximately, of which about 5,560 mi^2 is probably noncontributing, including 3,800 mi^2 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, 72,139 acre-ft, May 22, elevation, 1,266.27 ft; minimum, 50,090 acre-ft, Feb. 27, elevation, 1,262.02 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,265.94	70,260	--
Oct. 31	1,265.28	66,570	-3,690
Nov. 30	1,264.88	64,340	-2,230
Dec. 31	1,264.27	60,980	-3,360
CAL YR 1987	-	-	+5,480
Jan. 31	1,263.13	55,150	-5,830
Feb. 29	1,262.09	50,400	-4,750
Mar. 31	1,264.09	60,000	+9,600
Apr. 30	1,265.95	70,320	+10,320
May 31	1,266.12	71,280	+960
June 30	1,265.67	68,750	-2,530
July 31	1,265.27	66,510	-2,240
Aug. 31	1,264.81	63,960	-2,550
Sept. 30	1,264.53	62,420	-1,540
WTR YR 1988	-	-	-7,840

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 mi^2, approximately, of which about 5,560 mi^2 is probably noncontributing, including 3,800 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 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.--Records good. 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).--39 years, 129 ft^3/s, 93,460 acre-ft/yr; median of yearly mean discharges, 96 ft^3/s, 69,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,740 ft^3/s, Apr. 24, 1979, gage height, 36.26 ft; no flow at times in 1950, 1952-53, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 146 ft^3/s, Jan. 19, gage height, 26.84 ft; minimum daily, 6.7 ft^3/s, July 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	98	96	112	132	70	13	30	72	16	29	16
2	64	96	96	113	131	70	13	30	73	16	29	17
3	63	96	96	117	132	70	12	30	74	17	32	17
4	63	97	106	113	130	70	12	42	75	16	32	16
5	64	98	113	115	131	70	12	52	77	17	29	16
6	64	98	116	113	129	70	12	52	55	17	26	11
7	79	98	111	115	123	70	15	50	39	17	24	13
8	97	99	106	110	125	70	15	50	40	17	28	14
9	97	99	108	109	123	70	15	50	39	17	34	15
10	96	97	109	114	132	70	13	50	29	17	31	15
11	96	96	106	111	126	67	13	50	20	17	31	12
12	96	96	106	105	131	69	13	51	19	16	30	11
13	97	96	112	111	128	70	12	47	19	13	31	11
14	96	96	112	113	129	70	12	48	19	9.2	29	10
15	96	96	105	110	128	70	12	48	19	6.7	28	11
16	94	95	114	104	124	70	12	49	18	7.3	16	12
17	95	96	113	113	124	70	11	51	17	7.5	13	12
18	96	97	109	114	121	70	12	52	17	7.5	34	12
19	96	95	109	119	110	70	12	52	17	7.2	31	11
20	96	100	109	125	94	70	12	52	17	7.2	33	11
21	96	98	112	122	91	71	12	52	17	19	35	9.9
22	96	95	112	127	92	70	22	54	18	28	31	8.6
23	96	94	115	133	94	71	31	55	18	28	28	8.9
24	96	94	112	125	96	71	30	54	16	28	28	9.0
25	97	94	119	125	95	45	31	55	16	28	20	9.2
26	98	94	114	130	78	14	30	55	16	28	14	10
27	98	93	115	130	70	13	30	64	15	29	12	12
28	98	95	114	127	71	13	30	74	15	29	9.1	10
29	98	96	118	120	70	13	30	72	16	29	12	9.8
30	98	99	117	130	---	13	31	70	16	29	14	9.6
31	98	---	110	129	---	13	---	71	---	29	15	---
TOTAL	2780	2891	3410	3654	3260	1803	530	1612	918	569.6	788.1	360.0
MEAN	89.7	96.4	110	118	112	58.2	17.7	52.0	30.6	18.4	25.4	12.0
MAX	98	100	119	133	132	71	31	74	77	29	35	17
MIN	63	93	96	104	70	13	11	30	15	6.7	9.1	8.6
AC-FT	5510	5730	6760	7250	6470	3580	1050	3200	1820	1130	1560	714

CAL YR 1987 TOTAL 106709.6 MEAN 292 MAX 2170 MIN 4.4 AC-FT 211700
WTR YR 1988 TOTAL 22575.7 MEAN 61.7 MAX 133 MIN 6.7 AC-FT 44780

05058000 SHEYENNE RIVER NEAR BALDHILL DAM, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
29...	1000	97	755	8.20	10.0	6.5	--	--	--	--	--
DEC											
18...	1220	106	790	--	-3.0	1.0	--	--	--	--	--
JAN											
29...	1400	120	700	--	-1.0	0.5	--	--	--	--	--
MAR											
24...	1025	71	800	--	3.0	0.5	--	--	--	--	--
APR											
26...	1335	31	865	8.40	5.5	8.5	300	61	35	74	34
[a]26...	1336	31	865	8.40	5.5	8.5	320	66	37	75	33
JUN											
14...	1340	20	800	--	18.5	20.5	--	--	--	--	--
JUL											
29...	0935	28	775	8.80	26.0	23.0	250	47	33	70	36
SEP											
01...	1600	16	1000	--	30.0	19.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
26...	2	11	310	150	15	0.30	9.5	571	540	47.2	0.78
[a]26...	2	11	303	150	15	0.20	10	546	547	45.1	0.74
JUL											
29...	2	10	270	150	17	0.20	6.2	483	503	36.4	0.66

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										
26...	4	210	10	<1	60	190	0.6	1	2	330
[a]26...	3	150	4	<5	9	220	<0.1	2	<1	320
JUL										
29...	5	160	10	<1	60	540	0.2	1	<1	380

a - Split sample analysis for quality assurance.

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 mi^2, approximately, of which about 5,700 mi^2 is probably noncontributing, includes 3,800 mi^2 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 ft^3/s, 89,840 acre-ft/yr; median of yearly mean discharges, 97 ft^3/s, 70,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,580 ft^3/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, 150 ft^3/s, Feb. 28, gage height, 4.80 ft, minimum not determined; maximum gage height, 5.03 ft, Feb. 8.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.24	3.42	3.45	3.59	4.54	4.04	2.86	2.99	3.20	2.77	2.96	2.79
2	3.22	3.43	3.46	3.68	4.47	3.68	2.88	3.01	3.18	2.75	2.98	2.81
3	3.21	3.43	3.47	3.67	4.49	3.51	2.89	3.01	3.18	2.73	2.97	2.81
4	3.23	3.43	3.45	3.69	4.55	3.39	2.91	3.00	3.18	2.74	2.99	2.82
5	3.22	3.42	3.58	3.78	4.46	3.39	2.91	3.08	3.20	2.75	3.00	2.83
6	3.19	3.43	3.60	3.83	4.55	3.50	2.88	3.12	3.29	2.76	2.96	2.83
7	3.28	3.43	3.60	3.90	4.64	3.50	2.87	3.22	3.17	2.79	2.93	2.82
8	3.41	3.42	3.57	3.95	4.64	3.53	2.91	3.19	2.86	2.76	2.90	2.81
9	3.40	3.43	3.56	3.95	4.68	3.41	2.90	3.16	2.96	2.76	2.91	2.79
10	3.40	3.43	3.57	4.00	4.62	3.43	2.88	3.14	2.98	2.80	2.95	2.79
11	3.42	3.43	3.56	4.14	4.56	3.46	2.86	3.16	2.95	2.82	2.95	2.84
12	3.42	3.43	3.53	4.01	4.66	3.36	2.85	3.16	3.02	2.84	2.97	2.85
13	3.42	3.42	3.55	4.26	4.65	3.29	2.84	3.14	2.98	2.91	3.10	2.82
14	3.42	3.42	3.60	4.21	4.70	3.28	2.81	3.14	2.97	2.85	2.99	2.79
15	3.42	3.44	3.56	4.19	4.55	3.27	2.79	3.14	2.94	2.83	2.96	2.81
16	3.43	3.44	3.56	4.09	4.57	3.26	2.79	3.14	2.91	2.77	2.95	2.86
17	3.41	3.43	3.61	4.09	4.55	3.28	2.80	3.16	2.89	2.74	2.91	2.85
18	3.41	3.44	3.59	4.12	4.48	3.28	2.77	3.19	2.87	2.71	2.83	2.91
19	3.42	3.45	3.57	4.09	4.41	3.28	2.79	3.24	2.86	2.68	2.89	3.01
20	3.43	3.43	3.57	4.24	4.08	3.27	2.81	3.21	2.84	2.76	2.95	2.88
21	3.42	3.45	3.58	4.22	4.02	3.27	2.81	3.21	2.87	2.72	2.97	2.83
22	3.43	3.43	3.60	4.23	4.04	3.15	2.83	3.19	2.88	2.70	2.98	2.83
23	3.43	3.42	3.60	4.34	3.96	3.21	2.90	3.17	2.89	2.79	2.97	2.81
24	3.42	3.42	3.61	4.32	3.97	3.30	2.97	3.13	2.87	2.86	2.93	2.81
25	3.42	3.43	3.61	4.12	4.04	3.30	3.00	3.10	2.83	2.89	2.93	2.81
26	3.43	3.43	3.61	4.38	3.95	3.11	3.00	3.12	2.79	2.91	2.90	2.83
27	3.42	3.43	3.60	4.46	3.92	2.97	3.01	3.14	2.77	2.91	2.87	2.82
28	3.42	3.42	3.60	4.37	4.35	2.96	2.99	3.16	2.79	2.90	2.82	2.87
29	3.43	3.44	3.60	4.30	4.20	2.92	2.98	3.18	2.76	2.91	2.79	2.87
30	3.42	3.45	3.61	4.36	---	2.85	3.00	3.17	2.76	2.89	2.77	2.83
31	3.42	---	3.50	4.31	---	2.84	---	3.18	---	2.90	2.79	---
MEAN	3.38	3.43	3.57	4.09	4.39	3.30	2.88	3.14	2.95	2.80	2.93	2.83
MAX	3.43	3.45	3.61	4.46	4.70	4.04	3.01	3.24	3.29	2.91	3.10	3.01
MIN	3.19	3.42	3.45	3.59	3.92	2.84	2.77	2.99	2.76	2.68	2.77	2.79

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
APR 26...	1520	32	870	8.40	9.5	10.0	370	72	45	90	34

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 26...	2	12	320	220	24	0.30	4.1	690	659	59.6	0.94

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 26...	3	230	10	<1	75	70	0.7	1	2	430

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.--Estimated daily discharges: Dec. 31 to Mar. 14. Records good except those for period of estimated daily discharges, which are fair. Flow regulated by Lake Ashtabula (station 05057500) 108.5 mi upstream.

AVERAGE DISCHARGE.--32 years, 161 ft^3/s, 116,600 acre-ft/yr; median of yearly mean discharges, 160 ft^3/s, 116,000 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, 284 ft^3/s, Mar. 26, gage height, 3.63 ft; maximum gage height, 4.34 ft, Mar. 3, backwater from ice; minimum daily, 1.1 ft^3/s, Aug. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	102	100	118	130	170	73	41	60	9.1	20	13
2	70	103	98	116	130	225	69	39	61	8.3	1.2	10
3	67	104	94	114	130	250	69	38	60	6.4	1.1	8.7
4	65	104	86	114	130	240	64	37	60	6.0	5.4	7.4
5	65	103	95	114	130	190	61	37	59	5.2	15	6.3
6	66	103	106	114	130	140	55	36	56	3.8	20	5.2
7	66	103	115	114	128	140	51	41	52	3.7	26	4.6
8	68	102	126	114	128	160	51	42	50	3.4	23	5.3
9	65	102	127	114	130	175	43	56	56	3.7	23	3.3
10	69	101	121	114	130	170	40	72	60	3.6	26	2.9
11	92	102	119	114	130	160	36	68	44	2.9	24	4.9
12	96	103	113	110	130	155	34	61	32	5.8	23	5.7
13	98	103	120	110	130	140	34	56	27	32	19	6.9
14	99	103	111	108	130	135	31	56	33	18	16	6.5
15	100	104	112	108	132	128	29	55	33	7.8	21	7.9
16	101	108	110	107	135	119	27	54	30	4.9	23	9.2
17	102	109	107	107	138	118	25	51	33	4.6	34	9.1
18	101	101	105	105	140	108	25	52	30	5.0	36	13
19	101	109	114	119	142	117	24	56	27	7.5	28	42
20	100	77	122	121	144	114	22	60	21	7.1	20	31
21	102	88	119	123	146	113	21	66	20	6.0	18	29
22	101	106	117	126	148	115	21	72	15	5.1	16	28
23	101	112	117	128	150	118	21	71	19	4.0	13	25
24	102	106	118	130	152	131	22	65	21	4.1	9.6	33
25	104	105	116	130	154	161	22	62	19	3.1	8.1	26
26	104	98	114	130	156	204	22	58	15	2.3	10	19
27	101	115	114	130	160	127	26	57	13	1.9	18	11
28	101	95	119	125	165	127	37	55	12	1.5	20	10
29	101	101	120	130	165	104	42	52	10	1.2	19	10
30	101	101	121	130	---	86	42	55	9.9	1.2	15	9.7
31	102	---	119	130	---	74	---	57	---	23	14	---
TOTAL	2784	3073	3495	3667	4043	4514	1139	1678	1037.9	202.2	565.4	403.6
MEAN	89.8	102	113	118	139	146	38.0	54.1	34.6	6.52	18.2	13.5
MAX	104	115	127	130	165	250	73	72	61	32	36	42
MIN	65	77	86	105	128	74	21	36	9.9	1.2	1.1	2.9
AC-FT	5520	6100	6930	7270	8020	8950	2260	3330	2060	401	1120	801

CAL YR 1987 TOTAL 130095 MEAN 356 MAX 2810 MIN 20 AC-FT 258000
WTR YR 1988 TOTAL 26602.1 MEAN 72.7 MAX 250 MIN 1.1 AC-FT 52770

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
28...	1045	96	850	--	7.0	4.0	--	--	--	--	--
DEC											
17...	1100	106	865	--	-8.0	0.0	--	--	--	--	--
FEB											
17...	1435	138	960	--	2.5	0.0	--	--	--	--	--
MAR											
24...	1400	125	950	7.80	9.5	0.5	320	72	34	74	33
MAY											
12...	1125	62	1160	--	21.0	18.0	--	--	--	--	--
JUN											
16...	1045	29	980	--	19.0	21.0	--	--	--	--	--
JUL											
12...	1635	2.0	1060	--	28.0	24.0	--	--	--	--	--
AUG											
02...	1625	1.0	1060	8.20	26.0	26.5	310	61	37	110	43
31...	1140	15	1110	--	22.0	19.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
24...	2	11	260	190	27	0.20	12	599	577	202	0.81
AUG											
02...	3	13	270	230	45	0.40	16	669	677	1.90	0.91

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)
MAR										
24...	2	230	30	<1	59	100	0.6	1	2	370
AUG										
02...	10	270	10	<1	80	470	0.1	4	<1	510

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

LOCATION.--Lat 46°37'35", long 97°00'05", in NE¼NW¼ 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. 10 to Mar. 18, June 26 to July 6, July 9-12, and July 27 to Sept. 14. 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.--39 years, 202 ft^3/s, 146,300 acre-ft/yr; median of yearly mean discharges, 170 ft^3/s, 123,000 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, 460 ft^3/s, Mar. 7, gage height, 5.46 ft, backwater from ice; minimum daily, 11 ft^3/s, Sept. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	121	127	134	128	195	225	60	70	25	17	15
2	102	121	115	128	128	224	226	62	67	24	18	17
3	99	123	112	126	129	286	218	64	67	24	22	25
4	99	123	104	124	130	314	214	63	67	23	13	24
5	99	122	100	120	130	316	180	61	66	23	13	23
6	97	122	111	115	128	368	158	60	64	22	23	22
7	95	122	116	118	126	442	152	61	62	20	16	22
8	93	121	121	118	128	441	145	62	61	18	12	23
9	92	120	124	118	130	389	135	61	63	17	14	24
10	92	118	128	118	130	329	125	60	62	17	15	20
11	93	118	134	120	130	311	119	62	57	16	16	18
12	96	126	140	120	130	314	115	63	54	15	15	14
13	96	125	139	120	130	314	109	66	59	24	14	15
14	98	120	136	120	130	316	102	73	75	39	14	11
15	115	122	131	122	132	301	97	72	70	46	16	12
16	121	125	125	124	134	273	94	69	63	86	16	19
17	124	126	124	126	136	266	91	65	61	63	16	22
18	127	125	124	125	138	249	87	66	56	47	17	21
19	126	125	130	126	142	232	84	65	54	39	18	39
20	123	112	125	126	146	211	80	66	47	33	19	41
21	122	72	125	128	150	206	78	69	47	28	19	47
22	121	105	133	128	153	196	74	75	43	24	19	52
23	122	138	133	129	152	202	72	79	39	22	19	62
24	121	124	137	130	155	223	69	80	38	20	19	58
25	123	122	135	129	158	240	65	81	33	19	20	43
26	122	122	140	126	161	236	61	81	32	15	20	39
27	121	128	137	127	164	233	59	81	28	17	20	36
28	122	125	140	130	167	253	60	82	27	15	21	35
29	124	124	133	134	171	246	60	79	26	14	21	39
30	124	125	135	133	---	234	60	74	25	15	21	43
31	123	---	135	133	---	239	---	72	---	17	21	---
TOTAL	3433	3622	3949	3875	4066	8599	3414	2134	1583	827	544	881
MEAN	111	121	127	125	140	277	114	68.8	52.8	26.7	17.5	29.4
MAX	127	138	140	134	171	442	226	82	75	86	23	62
MIN	92	72	100	115	126	195	59	60	25	14	12	11
AC-FT	6810	7180	7830	7690	8060	17060	6770	4230	3140	1640	1080	1750

CAL YR 1987 TOTAL 143750 MEAN 394 MAX 2930 MIN 31 AC-FT 285100
WTR YR 1988 TOTAL 36927 MEAN 101 MAX 442 MIN 11 AC-FT 73240

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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											
03...	1305	122	852	8.40	10.0	8.0	1.3	11.5	98	22	86
JAN											
27...	1510	125	920	8.00	-4.0	0.0	3.3	12.2	84	10	38
MAR											
01...	1630	195	820	7.90	2.0	0.0	4.5	12.4	85	32	--
APR											
07...	1005	151	770	--	16.0	7.5	--	--	--	--	--
27...	1140	61	875	8.40	10.5	8.0	2.1	13.8	117	2	10
JUN											
24...	1400	39	842	8.50	32.0	26.5	22	6.2	78	56	25
JUL											
07...	1520	20	725	--	23.0	26.0	--	--	--	--	--
19...	1515	42	730	8.60	23.0	24.0	17	6.2	74	73	71
AUG											
31...	1610	20	--	--	30.0	19.0	--	7.5	--	--	--

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
NOV										
03...	310	72	31	68	32	2	9.2	268	298	14
JAN										
27...	330	72	36	77	33	2	10	294	359	0
MAR										
01...	290	65	31	62	31	2	10	264	322	0
APR										
27...	340	81	33	57	26	1	7.0	272	327	2
JUN										
24...	310	73	32	62	29	2	8.1	286	342	4
JUL										
19...	260	63	26	58	31	2	8.8	201	229	8

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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
NOV										
03...	150	23	0.30	8.4	539	523	0.73	178	<0.010	<0.100
JAN										
27...	160	18	0.30	12	565	563	0.77	191	<0.010	0.400
MAR										
01...	140	18	0.30	13	522	501	0.71	275	0.020	0.610
APR										
27...	170	24	0.30	11	547	546	0.74	89.5	<0.010	<0.100
JUN										
24...	130	22	0.50	24	546	525	0.74	57.1	<0.010	<0.100
JUL										
19...	160	19	0.20	18	472	475	0.64	53.1	<0.010	<0.100

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 03...	0.020	0.030	0.04	0.80	0.200	0.070	0.040	<10	4	76
JAN 27...	0.250	0.250	0.32	1.1	0.160	0.120	0.110	--	--	--
MAR 01...	0.180	0.180	0.23	1.4	0.170	0.160	0.090	10	4	71
APR 27...	<0.010	0.020	0.03	0.40	0.020	0.020	<0.010	<10	3	98
JUN 24...	0.030	0.050	0.06	0.60	0.240	0.080	0.060	--	--	--
JUL 19...	0.050	0.030	0.04	<0.20	0.210	0.040	0.020	<10	10	91

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 03...	<0.5	<1	<1	<3	3	6	<5	51	29	<0.1
MAR 01...	<0.5	<1	1	<3	3	33	<5	57	58	<0.1
APR 27...	<0.5	<1	<1	<3	1	10	<5	46	190	<0.1
JUL 19...	1	<1	1	<3	1	6	<5	48	5	<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)
NOV 03...	<10	3	<1	<1.0	330	<6	5	62	20	53
MAR 01...	<10	5	<1	<1.0	290	<6	8	31	16	93
APR 27...	<10	5	<1	<1.0	360	<6	6	50	8.2	44
JUL 19...	<10	4	<1	<1.0	310	<6	<3	61	6.9	99

05059400 SHEYENNE RIVER NEAR HORACE, ND

LOCATION.--Lat 46°48'13", long 96°54'13", in NW1/4NW1/4 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.--Records fair. Mean-daily gage heights for Dec. 29 to Feb. 5 and July 26-27 are missing. 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, 420 ft^3/s, Mar. 9, gage height, 10.23 ft; minimum not determined.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.46	5.96	6.19	---	---	8.10	8.41	5.03	5.34	4.29	3.69	4.10
2	5.53	5.94	6.23	---	---	8.34	8.38	5.03	5.28	4.26	3.74	4.09
3	5.61	5.94	6.13	---	---	8.57	8.36	5.06	5.22	4.24	3.97	4.10
4	5.58	5.95	6.09	---	---	8.83	8.33	5.13	5.17	4.22	4.18	4.17
5	5.51	5.95	6.00	---	---	9.19	8.19	5.14	5.18	4.21	4.18	4.21
6	5.52	5.95	5.92	---	7.76	9.44	7.82	5.08	5.14	4.18	4.10	4.20
7	5.50	5.95	6.00	---	7.75	9.56	7.04	5.06	5.09	4.20	4.15	4.19
8	5.46	5.95	6.12	---	7.68	9.91	6.61	5.08	5.04	4.19	4.28	4.17
9	5.42	5.95	6.24	---	7.63	10.18	6.16	5.11	5.01	4.19	4.19	4.15
10	5.41	5.91	6.29	---	7.66	10.01	6.00	5.11	5.02	4.18	4.10	4.12
11	5.41	5.76	6.34	---	7.70	9.52	5.86	5.08	4.99	4.15	4.04	4.10
12	5.40	5.86	6.42	---	7.77	9.25	5.74	5.10	4.90	4.13	4.00	4.09
13	5.43	6.00	6.54	---	7.85	8.99	5.67	5.12	4.87	4.16	3.97	4.10
14	5.44	5.99	6.60	---	7.92	8.91	5.58	5.15	4.94	4.14	4.06	4.07
15	5.46	5.92	6.57	---	7.89	8.93	5.50	5.31	5.17	4.19	4.17	4.15
16	5.69	5.94	6.52	---	7.92	8.92	5.42	5.39	5.24	4.25	4.29	4.15
17	5.87	5.98	6.46	---	7.97	8.80	5.36	5.31	5.04	5.15	4.27	4.14
18	5.91	5.98	6.39	---	8.00	8.67	5.33	5.21	4.95	5.26	4.28	4.17
19	5.93	5.96	6.29	---	8.03	8.55	5.29	5.19	4.88	4.86	4.24	4.32
20	5.94	6.05	6.35	---	8.05	8.40	5.24	5.22	4.82	4.66	4.14	4.29
21	5.94	6.00	6.43	---	8.08	8.26	5.20	5.25	4.78	4.48	4.05	4.42
22	5.94	5.82	6.43	---	8.13	8.19	5.18	5.30	4.72	4.32	4.02	4.51
23	5.95	5.83	6.42	---	8.17	8.19	5.15	5.37	4.67	4.22	4.08	4.66
24	5.94	6.27	6.50	---	8.21	8.21	5.13	5.45	4.62	4.15	4.30	4.72
25	5.93	6.38	6.57	---	8.24	8.27	5.11	5.47	4.57	4.11	4.39	4.82
26	5.94	6.22	6.57	---	8.31	8.37	5.09	5.49	4.52	4.07	4.31	4.71
27	5.94	6.18	6.51	---	8.38	8.41	5.07	5.52	4.49	---	4.23	4.60
28	5.94	6.24	6.48	---	8.30	8.41	5.06	5.53	4.47	---	4.18	4.57
29	5.94	6.24	---	---	8.06	8.46	5.04	5.52	4.40	3.95	4.16	4.58
30	5.95	6.19	---	---	---	8.47	5.05	5.50	4.32	3.73	4.14	4.57
31	5.97	---	---	---	---	8.41	---	5.41	---	3.68	4.11	---
MEAN	5.71	6.01	---	---	---	8.80	6.05	5.25	4.89	---	4.13	4.31
MAX	5.97	6.38	---	---	---	10.18	8.41	5.53	5.34	---	4.39	4.82
MIN	5.40	5.76	---	---	---	8.10	5.04	5.03	4.32	---	3.69	4.07

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
APR 11...	1415	134	700	8.00	20.5	10.0	300	70	30	59	29

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 11...	2	7.6	260	150	24	0.20	6.8	519	505	188	0.71

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 11...	5	230	10	<1	47	20	<0.1	1	2	360

05059500 SHEYENNE RIVER AT WEST FARGO, ND

LOCATION.--Lat 46°53'28", long 96°54'24", in SE¼SE¼ 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. 1-9, 27-28, Nov. 20 to Mar. 31, and May 26 to June 6. Records good except those for periods of estimated daily discharges, which are poor. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 246 mi upstream. Above 3,000 ft3/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).--61 years (water years 1904-5, 1930-88), 181 ft^3/s, 131,100 acre-ft/yr; median of yearly mean discharges, 150 ft^3/s, 109,000 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, 450 ft^3/s, Mar. 10, gage height, 9.28 ft, backwater from ice; minimum daily, 4.9 ft^3/s, Aug. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	130	120	137	132	157	374	67	110	31	4.9	19
2	100	129	124	130	126	172	375	66	104	31	7.2	19
3	100	128	128	128	128	200	368	68	98	30	7.5	18
4	100	132	132	126	130	224	359	71	92	30	16	19
5	100	130	135	124	128	260	334	76	86	28	24	22
6	100	130	135	122	130	320	304	73	80	26	21	22
7	100	130	129	120	130	340	239	73	73	26	20	22
8	100	129	138	118	132	380	199	74	71	26	26	21
9	100	129	146	116	130	420	157	74	69	24	27	20
10	103	128	148	118	132	440	138	75	68	25	22	19
11	103	120	148	122	134	400	127	74	68	21	19	18
12	104	118	146	123	135	360	118	75	63	20	21	17
13	103	134	145	122	136	320	112	76	62	20	26	17
14	104	135	144	122	147	290	106	79	69	19	16	17
15	106	131	142	128	146	280	99	86	72	18	20	15
16	113	131	140	120	137	280	94	97	87	21	23	23
17	130	134	138	128	148	270	89	95	77	44	28	19
18	136	135	136	125	149	250	87	90	68	89	26	22
19	138	134	128	129	151	230	85	90	65	68	27	40
20	140	130	126	130	152	210	82	98	58	49	24	25
21	140	124	133	130	144	200	78	105	57	37	20	25
22	141	111	135	143	155	190	76	106	54	29	17	31
23	142	112	133	141	157	190	75	109	51	23	15	38
24	142	106	134	146	155	218	74	116	46	20	21	45
25	142	100	134	145	155	230	72	119	40	17	30	53
26	140	100	138	139	162	247	71	116	37	15	31	52
27	135	104	138	145	170	273	69	116	35	14	27	43
28	128	108	138	149	190	294	68	117	33	5.9	23	41
29	128	112	137	138	170	310	67	117	34	12	22	41
30	129	116	137	136	---	334	66	119	34	8.3	21	39
31	130	---	136	135	---	352	---	117	---	5.0	20	---
TOTAL	3677	3690	4221	4035	4191	8641	4562	2834	1961	832.2	652.6	822
MEAN	119	123	136	130	145	279	152	91.4	65.4	26.8	21.1	27.4
MAX	142	135	148	149	190	440	375	119	110	89	31	53
MIN	100	100	120	116	126	157	66	66	33	5.0	4.9	15
AC-FT	7290	7320	8370	8000	8310	17140	9050	5620	3890	1650	1290	1630

CAL YR 1987 TOTAL 143105 MEAN 392 MAX 2800 MIN 55 AC-FT 283800
WTR YR 1988 TOTAL 40118.8 MEAN 110 MAX 440 MIN 4.9 AC-FT 79580

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
28...	1615	128	860	--	13.5	4.0	--	--	--	--	--
FEB											
03...	1325	128	780	--	-19.0	--	--	--	--	--	--
APR											
07...	1315	232	705	8.40	20.5	2.5	250	60	25	46	28
MAY											
13...	1420	77	935	--	13.5	17.5	--	--	--	--	--
JUN											
17...	1240	77	930	--	21.5	22.5	--	--	--	--	--
JUL											
13...	0915	20	790	--	20.0	22.0	--	--	--	--	--
28...	1050	5.3	795	8.30	28.0	26.0	290	68	30	62	31
SEP											
07...	1710	23	700	--	22.0	18.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	1	6.8	220	130	21	0.20	10	458	432	287	0.62
JUL											
28...	2	9.9	240	170	31	0.30	17	525	531	7.50	0.71

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										
07...	2	210	20	<1	41	70	0.4	1	2	290
JUL										
28...	8	200	10	<1	60	<10	0.1	3	<1	470

05059600 MAPLE RIVER NEAR HOPE, ND

LOCATION.--Lat 47°19'30", long 97°47'25", in NW¼NW¼ 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. 1-27 and Apr. 5-12. Records good 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 observed discharge, 75 ft^3/s, Mar. 24, gage height, 3.78 ft, backwater from ice; maximum gage height, 4.70 ft, Mar. 12, backwater from ice; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.50	1.0	.30	.00	.00	.00	.00
2						1.0	.84	.29	.00	.00	.00	.00
3						2.0	.68	.25	.00	.00	.00	.00
4						5.0	.65	.23	.00	.00	.00	.00
5						4.7	.62	.20	.00	.00	.00	.00
6						4.4	.60	.19	.00	.00	.00	.00
7						4.0	.58	.16	.00	.00	.00	.00
8						7.0	.56	.15	.00	.00	.00	.00
9						10	.54	.11	.00	.00	.00	.00
10						2.0	.52	.05	.00	.00	.00	.00
11						1.0	.50	.04	.00	.00	.00	.00
12						.90	.65	.04	.00	.00	.00	.00
13						.80	.87	.04	.00	.00	.00	.00
14						.70	.74	.02	.00	.00	.00	.00
15						.60	.73	.02	.00	.00	.00	.00
16						.50	.71	.02	.00	.00	.00	.00
17						2.0	.69	.01	.00	.00	.00	.00
18						4.0	.59	.01	.00	.00	.00	.00
19						5.0	.58	.02	.00	.00	.00	.00
20						4.0	.51	.01	.00	.00	.00	.00
21						5.0	.48	.00	.00	.00	.00	.00
22						12	.47	.00	.00	.00	.00	.00
23						25	.40	.00	.00	.00	.00	.00
24						50	.40	.00	.00	.00	.00	.00
25						20	.36	.00	.00	.00	.00	.00
26						15	.35	.00	.00	.00	.00	.00
27						10	.33	.00	.00	.00	.00	.00
28						7.2	.31	.00	.00	.00	.00	.00
29						4.3	.30	.00	.00	.00	.00	.00
30						2.1	.30	.00	.00	.00	.00	.00
31						1.5	---	.00	---	.00	.00	---
TOTAL						212.20	16.86	2.16	0.00	0.00	0.00	0.00
MEAN						6.85	.56	.070	.00	.00	.00	.00
MAX						50	1.0	.30	.00	.00	.00	.00
MIN						.50	.30	.00	.00	.00	.00	.00
AC-FT						421	33	4.3	.0	.0	.0	.0

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR											
04...	1015	31	680	7.80	2.0	0.5	220	48	24	29	20
07...	1645	10	750	--	1.0	2.0	--	--	--	--	--
APR											
13...	1300	1.0	1020	--	11.5	9.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
04...	0.9	22	108	160	23	0.10	16	425	387	35.1	0.58

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)
MAR										
04...	3	40	100	<1	28	170	0.1	1	1	220

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. 31 to Mar. 22, Apr. 27 to May 12, June 24 to July 19, and Aug. 1-30. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--32 years, 41.0 ft^3/s, 29,700 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 ft3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	0815	*302	a*7.84	Mar. 26	1700	199	5.34
Mar. 29	1300	246	5.62				

Minimum discharge, 0.62 ft^3/s, Sept. 6.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	2.1	2.4	2.0	1.7	34	115	7.2	3.6	1.7	2.4	.95
2	1.7	2.2	2.2	1.9	1.7	39	99	6.5	3.1	1.8	3.8	.86
3	1.9	2.7	2.2	1.9	1.7	36	92	5.7	2.9	1.8	3.8	1.0
4	1.8	2.7	2.2	1.8	1.7	20	87	5.6	2.6	1.9	3.8	1.0
5	1.7	2.7	2.2	1.7	1.7	17	79	5.5	2.7	2.0	3.7	.71
6	1.7	2.9	2.2	1.8	1.6	18	69	5.3	2.5	1.9	3.7	.62
7	1.7	2.9	2.3	1.8	1.6	23	61	5.2	2.5	1.8	3.6	1.7
8	1.8	3.0	2.2	1.8	1.6	35	56	5.1	2.4	1.9	3.6	2.0
9	2.0	3.6	2.3	1.9	1.6	92	50	5.0	2.3	1.9	3.6	2.1
10	2.0	3.4	2.3	1.9	1.6	111	42	4.9	2.3	1.8	3.4	1.7
11	2.3	3.3	2.3	1.9	1.7	142	36	4.7	2.3	1.6	3.1	2.6
12	2.1	3.2	2.5	2.0	1.8	140	33	4.6	2.3	1.4	2.9	2.7
13	2.1	2.9	2.2	2.1	1.9	135	30	3.9	2.8	1.6	2.6	1.2
14	2.1	2.9	2.2	2.1	2.0	132	26	3.6	3.1	2.3	2.4	1.9
15	2.3	2.9	2.2	2.2	2.1	128	24	3.2	2.9	1.8	2.2	3.0
16	2.5	3.1	2.2	3.0	2.3	121	22	3.2	2.9	1.5	1.9	3.5
17	2.4	2.5	2.2	2.9	2.5	115	21	3.1	2.5	1.5	1.7	3.7
18	2.4	2.2	2.1	2.7	2.1	108	18	3.0	2.3	1.5	1.4	3.6
19	2.1	2.2	2.0	1.4	2.2	102	17	3.2	2.5	1.8	1.4	4.3
20	1.9	2.2	2.0	1.3	2.2	95	15	3.0	2.3	1.8	1.4	2.6
21	1.9	2.2	2.0	1.3	2.2	89	14	3.4	1.7	2.2	1.4	2.3
22	2.0	2.4	2.0	1.4	2.1	82	15	3.3	1.4	2.1	1.4	2.1
23	1.9	2.2	2.1	1.4	2.0	94	14	3.2	1.2	1.9	1.4	2.0
24	2.0	2.3	2.1	1.6	1.9	127	13	3.0	1.4	2.4	1.4	2.0
25	2.0	2.3	2.1	1.8	2.0	128	11	2.8	1.5	1.8	1.4	1.9
26	2.0	2.2	2.3	1.8	2.5	114	11	3.4	1.5	1.7	1.4	2.0
27	2.1	2.3	2.3	1.8	3.3	150	11	4.2	1.5	2.6	1.4	1.7
28	2.1	2.3	2.2	1.8	15	171	9.5	3.4	1.5	2.3	1.4	2.1
29	2.2	2.3	2.1	1.8	47	160	8.7	3.5	1.6	2.3	1.3	2.3
30	2.1	2.4	2.1	1.8	---	137	8.0	4.1	1.6	2.3	1.3	1.9
31	2.0	---	2.1	1.7	---	131	---	3.3	---	2.6	1.3	---
TOTAL	62.5	78.5	67.8	58.3	115.3	3026	1107.2	129.1	67.7	59.5	71.5	62.04
MEAN	2.02	2.62	2.19	1.88	3.98	97.6	36.9	4.16	2.26	1.92	2.31	2.07
MAX	2.5	3.6	2.5	3.0	47	171	115	7.2	3.6	2.6	3.8	4.3
MIN	1.7	2.1	2.0	1.3	1.6	17	8.0	2.8	1.2	1.4	1.3	.62
AC-FT	124	156	134	116	229	6000	2200	256	134	118	142	123

CAL YR 1987 TOTAL 23245.3 MEAN 63.7 MAX 1940 MIN 1.3 AC-FT 46110
WTR YR 1988 TOTAL 4905.44 MEAN 13.4 MAX 171 MIN .62 AC-FT 9730

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT 28...	1320	2.1	1650	--	13.5	6.5	--	--	--	--	--
DEC 17...	1340	2.2	1700	--	-3.0	2.0	--	--	--	--	--
JAN 15...	1345	2.2	1900	--	-1.0	1.0	--	--	--	--	--
FEB 17...	1740	2.5	1680	--	0.0	0.5	--	--	--	--	--
MAR 31...	1515	182	850	8.10	6.0	0.5	310	73	30	53	26
MAY 12...	1310	4.6	1540	--	23.0	18.5	--	--	--	--	--
JUN 16...	1235	2.8	2000	--	21.0	19.5	--	--	--	--	--
JUL 19...	1305	1.8	1760	7.80	22.0	22.0	710	180	62	120	27
AUG 31...	1330	1.3	1710	--	24.0	18.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 31...	1	14	170	230	33	0.20	19	589	553	289	0.80
JUL 19...	2	12	380	540	68	0.30	19	1080	1410	5.31	1.47

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)
MAR 31...	4	210	40	<1	43	100	0.2	2	2	320
JUL 19...	5	260	20	<1	130	750	0.2	1	<1	970

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 mi^2.

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: Nov. 17 to Feb. 9 and Feb. 26 to Apr. 1. Records fair except those for periods of estimated discharges, which are poor.

AVERAGE DISCHARGE.--42 years, 9.47 ft^3/s, 6,860 acre-ft/yr; median of yearly mean discharges, 6.2 ft^3/s, 4,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,490 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	1930	ice jam	*[a]10.02	Apr. 1	----	*[b]30	Backwater from ice

No flow for several months.
a - Backwater from ice
b - About

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.50	.28	.00	2.0	15	2.4	.03	.00	.00	.00
2	.00	.00	.50	.26	.00	3.0	21	2.2	.00	.00	.00	.00
3	.00	.00	.50	.24	.00	4.0	17	2.4	.0	.00	.00	.00
4	.00	.00	.50	.22	.00	5.0	16	2.4	.0	.00	.00	.00
5	.00	.00	.50	.20	.00	7.0	15	2.1	.00	.00	.00	.00
6	.00	.00	.55	.18	.00	4.0	14	1.9	.00	.00	.00	.00
7	.00	.18	.60	.16	.00	3.0	14	1.7	.00	.00	.00	.00
8	.00	.48	.60	.12	.00	2.0	12	1.8	.00	.00	.00	.00
9	.00	.51	.60	.08	.00	1.0	11	1.6	.00	.00	.00	.00
10	.00	.43	.60	.06	.00	.60	9.8	1.3	.00	.00	.00	.00
11	.00	.40	.60	.04	.00	.50	8.7	1.0	.00	.00	.00	.00
12	.00	1.8	.55	.02	.00	.40	7.0	.93	.00	.00	.00	.00
13	.00	2.1	.50	.00	.00	.60	5.4	.91	.00	.00	.00	.00
14	.00	1.1	.70	.00	.00	1.0	5.9	.96	.00	.00	.00	.00
15	.00	.81	1.0	.00	.00	1.5	4.9	.95	.00	.00	.00	.00
16	.00	.72	1.2	.00	.00	2.0	4.2	.83	.00	.00	.00	.00
17	.00	.70	1.0	.00	.00	2.3	3.3	.75	.00	.00	.00	.00
18	.00	.65	.75	.00	.00	2.6	2.9	.69	.00	.00	.00	.00
19	.00	.65	.65	.00	.00	3.0	2.3	.64	.00	.00	.00	.00
20	.00	.60	.60	.00	.00	4.0	2.4	.55	.00	.00	.00	.00
21	.00	.55	.55	.00	.00	4.0	2.3	.40	.00	.00	.00	.00
22	.00	.55	.50	.00	.00	5.0	1.8	.50	.00	.00	.00	.00
23	.00	.55	.50	.00	.00	6.0	1.6	.53	.00	.00	.00	.00
24	.00	.55	.45	.00	.00	7.0	1.6	.52	.00	.00	.00	.00
25	.00	.55	.40	.00	.00	7.5	1.6	.42	.09	.00	.00	.00
26	.00	.50	.35	.00	.20	8.0	1.8	.32	.13	.00	.00	.00
27	.00	.50	.35	.00	.40	8.5	1.4	.25	.01	.00	.00	.00
28	.00	.50	.35	.00	.50	9.0	1.2	.21	.00	.00	.00	.00
29	.00	.50	.35	.00	.60	9.5	1.0	.16	.00	.00	.00	.00
30	.00	.50	.30	.00	---	10	1.3	.11	.00	.00	.00	.00
31	.00	---	.30	.00	---	12	---	.09	---	.00	.00	---
TOTAL	0.00	16.38	17.40	1.86	1.70	136.00	207.4	31.52	0.26	0.00	0.00	0.00
MEAN	.00	.55	.56	.060	.059	4.39	6.91	1.02	.009	.00	.00	.00
MAX	.00	2.1	1.2	.28	.60	12	21	2.4	.13	.00	.00	.00
MIN	.00	.00	.30	.00	.00	.40	1.0	.09	.00	.00	.00	.00
AC-FT	.0	32	35	3.7	3.4	270	411	63	.5	.0	.0	.0

CAL YR 1987 TOTAL 5009.04 MEAN 13.7 MAX 350 MIN .00 AC-FT 9940
WTR YR 1988 TOTAL 412.52 MEAN 1.13 MAX 21 MIN .00 AC-FT 818

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
DEC											
17...	1505	0.94	2200	--	-3.0	0.0	--	--	--	--	--
APR											
05...	1330	14	852	8.10	11.5	2.5	350	84	34	44	21
MAY											
10...	1355	1.2	1370	--	21.5	15.5	--	--	--	--	--
25...	1035	0.46	--	--	24.0	17.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	1	9.4	220	210	23	0.20	15	583	555	22.2	0.79

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										
05...	3	200	30	<1	64	190	0.4	2	2	400

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: Nov. 21 to Apr. 2. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--27 years (1961-88), 1,799 ft^3/s, 1,303,000 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, 5,010 ft^3/s, Mar. 28, gage height, 12.42 ft; maximum gage height, 12.57 ft, Mar. 12, backwater from ice; minimum daily, 64 ft^3/s, July 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	414	452	532	355	362	613	4500	925	747	233	81	103
2	400	441	524	340	374	670	4220	910	729	220	94	102
3	389	449	500	345	390	700	3810	898	715	206	102	101
4	379	450	468	352	399	705	3640	874	706	195	106	101
5	379	450	456	363	413	715	3730	872	673	194	125	98
6	386	464	451	357	428	800	3660	876	611	193	129	96
7	384	483	449	337	449	955	3410	853	544	187	145	100
8	379	487	462	329	472	1150	3180	832	497	176	174	103
9	384	484	448	331	485	1430	2900	849	458	161	173	103
10	405	448	447	331	485	2120	2580	851	430	157	158	98
11	413	443	456	324	472	3200	2300	841	412	147	150	92
12	404	466	464	323	463	3620	2100	847	411	145	186	86
13	391	470	474	323	476	3500	1940	823	415	160	222	85
14	381	456	452	330	486	3170	1810	840	422	143	200	90
15	380	474	443	334	494	2680	1720	864	454	147	219	94
16	387	488	456	334	500	2380	1650	845	510	161	264	106
17	392	472	445	328	507	2290	1580	824	475	154	257	115
18	395	452	439	312	509	2250	1520	748	434	181	234	128
19	411	419	454	289	506	2240	1480	683	396	210	211	213
20	428	443	476	276	510	2250	1450	641	341	209	187	303
21	440	493	481	272	519	2350	1400	644	321	202	171	409
22	446	436	470	268	532	2480	1330	694	297	167	153	397
23	446	484	464	268	540	2710	1280	778	311	135	141	333
24	441	523	465	274	540	3200	1190	787	329	119	129	289
25	438	486	467	279	541	4010	1090	759	335	103	116	260
26	437	495	465	288	541	4640	1010	754	338	86	110	250
27	446	548	468	309	539	4890	969	761	320	85	106	236
28	461	558	467	326	548	4940	985	747	302	79	112	228
29	475	559	456	329	573	4940	987	735	283	68	114	220
30	477	543	422	339	---	4800	954	742	255	64	107	209
31	472	---	388	353	---	4660	---	741	---	65	103	---
TOTAL	12860	14316	14309	9918	14053	81058	64375	24838	13471	4752	4779	5148
MEAN	415	477	462	320	485	2615	2146	801	449	153	154	172
MAX	477	559	532	363	573	4940	4500	925	747	233	264	409
MIN	379	419	388	268	362	613	954	641	255	64	81	85
AC-FT	25510	28400	28380	19670	27870	160800	127700	49270	26720	9430	9480	10210

CAL YR 1987 TOTAL 579423 MEAN 1587 MAX 9740 MIN 378 AC-FT 1149000
WTR YR 1988 TOTAL 263877 MEAN 721 MAX 4940 MIN 64 AC-FT 523400

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-67, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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												
04...	1430	449	710	8.50	9.0	8.0	9.2	11.5	98	25	47	310
JAN												
26...	1435	292	830	8.00	-3.0	0.0	2.6	12.1	--	30	30	360
MAR												
02...	1330	667	775	7.90	-3.0	0.0	7.6	11.5	79	--	--	310
APR												
11...	1715	580	580	--	21.0	4.5	--	--	--	--	--	--
28...	1205	954	658	8.60	17.5	10.5	24	13.0	117	0	20	300
JUN												
21...	1250	319	765	8.30	27.0	26.5	64	6.5	81	--	--	290
JUL												
13...	1725	161	685	--	26.5	27.5	--	--	--	--	--	--
21...	1200	204	670	8.90	27.0	24.0	82	6.1	73	140	39	270
SEP												
02...	1430	102	--	--	23.0	19.0	--	--	--	--	--	--

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 WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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												
04...	66	34	38	21	1	6.8	270	316	7	100	19	0.30
JAN												
26...	77	40	47	22	1	9.0	310	378	0	120	18	0.30
MAR												
02...	63	37	44	23	1	8.5	282	344	0	89	31	0.30
APR												
28...	65	34	24	14	0.6	6.0	227	270	4	110	13	0.20
JUN												
21...	58	35	54	28	1	8.3	242	290	2	110	36	0.50
JUL												
21...	50	35	44	25	1	8.8	224	235	19	96	27	0.30

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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
NOV												
04...	7.3	453	435	0.62	549	0.010	0.210	0.170	0.240	0.31	1.3	0.230
JAN												
26...	16	503	517	0.68	397	0.010	0.580	0.410	0.420	0.54	1.4	0.160
MAR												
02...	16	465	462	0.63	837	0.020	0.940	0.330	0.300	0.39	1.4	0.170
APR												
28...	8.0	407	398	0.55	1050	0.020	0.160	0.030	0.040	0.05	0.80	0.120
JUN												
21...	12	467	463	0.64	402	0.020	0.930	0.050	0.080	0.10	0.70	0.490
JUL												
21...	5.0	439	403	0.60	242	0.010	0.300	0.040	0.030	0.04	1.3	0.930

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 04...	0.180	0.130	<10	3	140	<0.5	<1	<1	<3	4	9
JAN 26...	0.140	0.110	--	--	--	--	--	--	--	--	--
MAR 02...	0.140	0.090	<10	3	78	<0.5	<1	<1	<3	3	11
APR 28...	0.080	0.040	<10	3	93	<0.5	<1	<1	<3	2	11
JUN 21...	0.340	0.260	--	--	--	--	--	--	--	--	--
JUL 21...	0.600	0.550	<10	11	61	1	45	<1	<3	5	7

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 04...	<5	35	5	<0.1	<10	5	<1	1.0	250	<6	8
MAR 02...	<5	37	45	<0.1	<10	3	<1	<1.0	230	<6	8
APR 28...	<5	26	3	<0.1	<10	5	<1	1.0	230	<6	7
JUL 21...	<5	14	2	<0.1	<10	5	1	<1.0	230	10	<3

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)
NOV 04...	2.8	<0.4	8.3	<0.4	6.1	<0.4	0.08	1.5	68	82	97
JAN 26...	--	--	--	--	--	--	--	--	47	37	56
MAR 02...	--	--	--	--	--	--	--	--	23	41	100
APR 28...	1.5	<0.4	12	<0.4	8.5	<0.4	0.08	2.2	117	301	99
JUN 21...	--	--	--	--	--	--	--	--	130	112	99
JUL 21...	--	--	--	--	--	--	--	--	145	80	100

05064900 BEAVER CREEK NEAR FINLEY, ND
(Hydrologic bench-mark station)

LOCATION.--Lat 47°35'40", long 97°42'18", in NE1/4 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 mi^2, 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: Nov. 22 to Apr. 3 and Aug. 1-18. 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.--24 years, 9.04 ft^3/s, 6,550 acre-ft/yr; median of yearly mean discharges, 9.0 ft^3/s, 6,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,900 ft^3/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, 130 ft^3/s, Mar. 24, gage height, 4.07 ft, backwater from ice; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.65	.28	.15	.00	.00	.70	30	.78	.02	.00	1.5	.00
2	.63	.28	.13	.00	.00	.60	50	.66	.00	.00	.70	.00
3	.52	.28	.11	.00	.00	.50	86	.55	.00	.00	1.0	.00
4	.48	.32	.08	.00	.00	7.5	73	.49	.00	.00	.70	.00
5	.40	.28	.04	.00	.00	15	56	.46	.00	.00	.50	.00
6	.36	.26	.02	.00	.00	15	43	.46	.00	.00	.30	.00
7	.34	.27	.00	.00	.00	45	35	.43	.00	.00	.25	.00
8	.35	.31	.00	.00	.00	50	32	.52	.00	.00	.20	.00
9	.36	.27	.00	.00	.00	60	30	.49	.00	.00	.17	.00
10	.32	.27	.00	.00	.00	50	23	.40	.00	.00	.14	.00
11	.28	.26	.00	.00	.00	35	18	.37	.00	.00	.12	.00
12	.28	.27	.00	.00	.00	22	15	.45	.00	.00	1.5	.00
13	.27	.28	.00	.00	.00	15	15	.46	.00	9.8	5.0	.00
14	.26	.28	.00	.00	.00	10	18	.31	.00	29	1.5	.00
15	.25	.29	.00	.00	.00	8.0	15	.38	.00	9.7	.40	.00
16	.26	.34	.00	.00	.00	7.0	12	.40	.00	4.8	.15	.00
17	.26	.33	.00	.00	.00	6.0	9.6	.38	.00	7.1	.04	.00
18	.25	.31	.00	.00	.00	5.5	7.7	.32	.00	35	.01	.00
19	.25	.31	.00	.00	.00	5.0	5.9	.33	.00	25	.01	.00
20	.25	.31	.00	.00	.00	4.5	4.3	.34	.00	17	.01	.00
21	.25	.30	.00	.00	.00	10	3.2	.34	.00	13	.00	.00
22	.25	.26	.00	.00	.00	30	2.7	.34	.00	10	.00	.00
23	.26	.24	.00	.00	.00	75	2.2	.31	.00	6.8	.00	.00
24	.26	.22	.00	.00	.00	130	1.8	.29	.00	4.2	.00	.00
25	.26	.20	.00	.00	.00	100	1.5	.25	.00	2.8	.00	.00
26	.28	.20	.00	.00	.10	80	1.3	.22	.00	1.8	.00	.00
27	.28	.19	.00	.00	.50	60	1.3	.23	.00	1.1	.00	.00
28	.28	.18	.00	.00	1.0	40	1.1	.23	.00	.75	.00	.00
29	.27	.17	.00	.00	.80	35	1.0	.18	.00	.57	.00	.00
30	.26	.16	.00	.00	---	30	.92	.07	.00	.40	.00	.00
31	.27	---	.00	.00	---	40	---	.05	---	.31	.00	---
TOTAL	9.94	7.92	0.53	0.00	2.40	992.30	595.52	11.49	0.02	179.13	14.20	0.00
MEAN	.32	.26	.017	.00	.083	32.0	19.9	.37	.001	5.78	.46	.00
MAX	.65	.34	.15	.00	1.0	130	86	.78	.02	35	5.0	.00
MIN	.25	.16	.00	.00	.00	.50	.92	.05	.00	.00	.00	.00
AC-FT	20	16	1.1	.0	4.8	1970	1180	23	.04	355	28	.0

CAL YR 1987 TOTAL 8667.31 MEAN 23.7 MAX 450 MIN .00 AC-FT 17190
WTR YR 1988 TOTAL 1813.45 MEAN 4.95 MAX 130 MIN .00 AC-FT 3600

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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												
20...	1005	0.24	1690	8.20	0.0	3.5	17	12.9	96	24	88	610
NOV												
25...	1255	0.20	680	7.10	-3.5	1.5	--	10.4	74	--	--	--
MAR												
04...	1252	1.0	1210	--	3.0	0.5	--	--	--	--	--	--
07...	1410	39	1420	--	1.0	1.5	--	--	--	--	--	--
24...	1350	130	--	--	--	--	--	--	--	--	--	--
31...	1010	39	898	8.20	3.0	1.0	3.3	11.6	82	28	250	320
APR												
13...	1510	12	1090	--	10.0	11.0	--	--	--	--	--	--
MAY												
17...	1240	0.38	1640	7.90	16.5	16.0	27	12.2	126	360	44	600
AUG												
19...	1100	0.01	--	--	19.0	21.0	--	--	--	--	--	--

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 WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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												
20...	140	63	130	31	2	15	386	471	0	460	36	0.30
NOV												
25...	--	--	--	--	--	--	165	201	0	--	--	--
MAR												
31...	72	34	67	31	2	7.8	166	--	--	270	12	0.20
MAY												
17...	130	66	130	32	2	7.0	155	189	0	530	30	0.30

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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)
OCT												
20...	14	1060	1090	1.44	0.69	<0.010	<0.100	0.050	0.030	0.04	1.5	0.040
MAR												
31...	16	593	588	0.81	62.6	0.080	1.90	0.150	0.130	0.17	1.4	0.190
MAY												
17...	6.7	1160	994	1.58	1.19	<0.010	<0.100	0.040	0.050	0.06	1.2	0.070

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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											
20...	<0.010	<0.010	<10	3	70	<0.5	<1	1	<3	<1	12
MAR											
31...	0.160	0.110	<10	2	37	<0.5	6	1	<3	2	40
MAY											
17...	0.070	0.020	<10	3	61	<0.5	<1	2	<3	<1	12

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 20...	<5	96	160	0.1	<10	4	<1	<1.0	640	<6	6
MAR 31...	<5	42	160	0.4	<10	4	1	<1.0	260	<6	5
MAY 17...	<5	88	2	<0.1	<10	3	<1	1.0	630	<6	<3

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)
MAR 31...	12	<0.4	17	1.2	12	1.1	0.05	7.4	17	1.8	98
MAY 17...	--	--	--	--	--	--	--	--	36	0.04	68

05066500 GOOSE RIVER AT HILLSBORO, ND

LOCATION.--Lat 47°24'34", long 97°03'39", in NW1/4 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: Nov. 19 to Mar. 10, May 25 to June 6, and Aug. 8 to Sept. 1. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--55 years (1931-32, 1934-88), 71.9 ft^3/s, 52,090 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 ft3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft3/s)	Gage height (ft)
Mar. 11	1545	587	3.22	Mar. 28	2315	*1060	*3.86

Minimum discharge, 0.00 ft^3/s, Sept. 5, 6, 9-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	18	28	14	12	35	688	59	24	11	4.2	.30
2	11	18	27	14	12	47	661	55	21	8.9	4.7	.26
3	13	19	27	14	12	74	599	53	19	7.9	3.0	.15
4	16	23	26	13	12	89	526	53	17	4.6	1.9	.10
5	13	23	26	13	12	104	523	53	14	2.8	1.2	.00
6	11	30	26	13	12	138	527	48	12	1.7	.57	.00
7	13	26	26	13	12	172	473	39	11	1.5	.30	.01
8	12	21	26	12	12	224	399	38	9.6	3.2	.30	.07
9	11	21	26	12	12	246	328	38	7.9	5.4	.25	.00
10	11	19	26	12	12	308	283	36	7.2	6.6	.30	.00
11	13	18	26	12	12	519	248	32	6.7	2.0	.30	.00
12	14	18	25	12	11	485	221	30	7.8	2.3	.40	.00
13	15	18	24	12	11	319	195	34	5.8	3.1	.50	.00
14	15	19	24	12	14	240	174	40	3.7	.84	.50	.00
15	17	23	23	12	12	209	155	38	3.1	.30	.45	.00
16	18	30	23	13	12	205	137	38	2.4	.29	.40	.36
17	17	32	23	13	12	173	130	35	2.7	1.6	.35	.92
18	17	32	22	12	13	161	127	35	3.6	1.9	.35	1.3
19	17	31	22	12	14	171	126	37	6.7	4.1	.30	4.4
20	17	30	22	12	15	164	115	37	14	16	.35	2.3
21	18	28	21	12	14	161	106	25	23	14	.30	1.9
22	17	28	21	12	15	167	90	26	21	9.3	.35	1.4
23	16	28	21	12	14	184	87	28	22	5.5	.40	.42
24	16	28	21	12	15	328	86	32	27	3.4	.35	.33
25	15	28	21	11	14	568	85	35	28	2.5	.30	.17
26	15	28	19	11	16	765	83	35	27	2.7	.35	.32
27	14	28	17	12	17	881	82	34	25	3.5	.35	.12
28	16	28	16	12	23	996	76	33	11	3.1	.30	.21
29	18	28	15	13	29	1010	70	31	9.5	3.7	.30	.49
30	17	28	15	13	---	927	61	28	11	3.5	.25	.59
31	17	---	14	12	---	751	---	26	---	2.9	.30	---
TOTAL	476	749	699	384	403	10821	7461	1161	403.7	140.13	24.17	16.12
MEAN	15.4	25.0	22.5	12.4	13.9	349	249	37.5	13.5	4.52	.78	.54
MAX	26	32	28	14	29	1010	688	59	28	16	4.7	4.4
MIN	11	18	14	11	11	35	61	25	2.4	.29	.25	.00
AC-FT	944	1490	1390	762	799	21460	14800	2300	801	278	48	32

CAL YR 1987 TOTAL 93046.1 MEAN 255 MAX 3500 MIN 5.8 AC-FT 184600
WTR YR 1988 TOTAL 22738.12 MEAN 62.1 MAX 1010 MIN .00 AC-FT 45100

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
29...	1525	18	1580	--	19.0	6.0	--	--	--	--	--
DEC											
22...	1355	21	980	--	-2.0	0.0	--	--	--	--	--
FEB											
18...	1600	12	2040	--	2.5	0.0	--	--	--	--	--
MAR											
31...	1635	717	815	8.10	4.0	0.5	310	73	32	41	21
MAY											
16...	1345	39	1480	--	17.0	15.5	--	--	--	--	--
JUN											
20...	1300	16	1510	--	29.0	25.0	--	--	--	--	--
AUG											
03...	1650	2.7	1620	8.50	19.5	25.0	610	120	74	130	31
[a]03...	1651	2.7	1620	8.50	19.5	25.0	600	120	73	120	30
SEP											
02...	1115	0.23	1700	--	22.0	19.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
31...	1	9.5	160	240	20	0.20	17	567	526	1100	0.77
AUG											
03...	2	14	300	480	86	0.40	8.3	1120	1100	8.13	1.52
[a]03...	2	10	295	490	88	0.40	11	1150	1090	8.35	1.56

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)
MAR										
31...	3	150	40	<1	36	120	0.4	2	2	300
AUG										
03...	9	250	20	<1	120	520	<1.0	4	<1	830
[a]03...	12	260	7	<5	120	580	<0.1	4	<1	680

a - Split sample analysis for quality assurance.

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, .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 May 1901 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. 30 to Apr. 4. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--106 years, 2,614 ft^3/s, 1,894,000 acre-ft/yr; median of yearly mean discharge, 2,370 ft^3/s, 1,720,000 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, 8,500 ft^3/s, Apr. 5, gage height, 21.16 ft; minimum daily, 168 ft^3/s, July 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	859	656	738	576	448	634	6100	1420	919	417	197	239
2	884	653	711	547	450	644	6140	1350	1030	372	226	221
3	855	636	687	520	455	676	6740	1280	1080	346	247	226
4	788	633	628	514	455	728	7670	1250	1020	324	261	220
5	753	654	565	510	465	778	8200	1230	944	321	261	225
6	759	651	574	510	470	822	8400	1220	799	331	253	218
7	729	659	620	502	475	915	8370	1180	709	295	292	208
8	659	668	638	487	480	1110	8130	1120	742	301	323	193
9	601	679	641	462	480	1310	7700	1130	765	284	335	206
10	578	687	636	444	480	1650	7060	1120	665	285	356	239
11	548	658	619	437	490	2410	6000	1130	561	286	340	224
12	596	629	627	442	500	3500	5100	1120	483	281	320	210
13	601	652	609	437	505	4160	4560	1110	480	289	306	192
14	584	690	597	421	509	4230	3990	1110	501	295	342	183
15	582	689	594	416	523	3980	3580	1100	501	270	378	176
16	566	704	565	431	532	3570	3250	1140	510	264	387	206
17	595	756	551	442	536	3180	2930	1140	538	252	433	225
18	564	732	573	445	532	2930	2750	1100	576	292	458	240
19	551	714	576	448	532	2820	2570	1030	551	330	451	319
20	581	540	584	438	532	2720	2410	976	533	357	422	417
21	601	404	612	423	538	2630	2330	885	516	381	381	564
22	581	492	641	407	546	2620	2210	870	554	382	326	856
23	620	645	652	412	548	2700	2070	907	540	351	302	932
24	615	608	645	417	565	3140	1940	1020	516	319	289	891
25	616	666	635	409	582	4150	1780	1080	525	297	274	755
26	584	705	623	413	594	4580	1660	1050	568	253	266	616
27	603	694	614	422	602	5050	1570	1030	585	236	247	537
28	624	724	614	409	629	5450	1490	1050	558	215	259	494
29	624	735	614	420	628	5830	1460	999	520	186	255	486
30	634	744	614	432	---	6060	1450	926	466	188	259	475
31	653	---	611	441	---	6140	---	917	---	168	249	---
TOTAL	19988	19757	19208	14034	15081	91117	129610	33990	19255	9168	9695	11193
MEAN	645	659	620	453	520	2939	4320	1096	642	296	313	373
MAX	884	756	738	576	629	6140	8400	1420	1080	417	458	932
MIN	548	404	551	407	448	634	1450	870	466	168	197	176
AC-FT	39650	39190	38100	27840	29910	180700	257100	67420	38190	18180	19230	22200

CAL YR 1987 TOTAL 1012949 MEAN 2775 MAX 17200 MIN 404 AC-FT 2009000
WTR YR 1988 TOTAL 392096 MEAN 1071 MAX 8400 MIN 168 AC-FT 777700

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
26...	1510	571	700	--	6.0	5.5	--	--	--	--	--
NOV											
23...	1600	656	790	--	-3.0	1.0	--	--	--	--	--
JAN											
20...	1600	436	810	--	-10.0	0.5	--	--	--	--	--
FEB											
29...	1600	621	770	--	0.0	0.5	--	--	--	--	--
APR											
05...	1305	8360	475	7.60	5.0	5.0	220	51	22	14	12
11...	1335	5990	--	--	20.0	--	--	--	--	--	--
25...	1530	1730	590	--	6.0	8.0	--	--	--	--	--
MAY											
25...	1310	1100	665	--	27.0	18.0	--	--	--	--	--
JUN											
24...	0935	500	--	--	25.0	26.0	--	--	--	--	--
JUL											
11...	1100	288	640	--	20.0	25.0	--	--	--	--	--
25...	1000	296	580	7.50	21.0	24.0	240	49	29	35	23
AUG											
01...	0900	217	550	--	18.0	23.0	--	--	--	--	--
26...	1030	262	625	--	18.0	22.0	--	--	--	--	--
SEP											
26...	1200	627	--	--	10.0	12.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	0.4	6.7	170	75	13	0.10	16	283	299	6390	0.38
JUL											
25...	1	5.8	230	77	30	0.30	11	372	375	297	0.51

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										
05...	3	140	110	1	18	20	0.5	2	3	190
JUL										
25...	8	110	10	<1	30	10	0.2	3	<1	290

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND

LOCATION.--Lat 48°14'50", long 98°07'00", in SE¼NW¼ sec.16, T.155 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 mi^2, of which about 9 mi^2 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: Feb. 28 to Apr. 4. Records good except those for period of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--28 years, 2.90 ft^3/s, 2,100 acre-ft/yr; median of yearly mean discharges, 2.2 ft^3/s, 1,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 984 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 4	----	*22	a*4.62				

No flow for several months.
a - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	14	.09	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	11	.06	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	12	.03	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	19	.01	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.26	13	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.58	9.9	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.70	8.4	.02	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.59	7.2	.08	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.41	5.3	.06	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.47	3.7	.02	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.44	2.5	.01	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.49	1.9	.01	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.33	1.6	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.29	1.3	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.40	1.2	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.50	1.0	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.70	.88	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	1.0	.75	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	1.5	.66	.01	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	1.5	.54	.02	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	1.5	.45	.01	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	2.0	.40	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	2.5	.34	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	5.0	.28	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	7.2	.23	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	4.0	.20	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	5.7	.17	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	6.4	.14	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	4.3	.12	.17	.00	.00	.00	.00
30	.00	.00	.00	.00	---	3.6	.11	.06	.00	.00	.00	.00
31	.00	---	.00	.00	---	11	---	.02	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	63.36	118.27	0.68	0.00	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	2.04	3.94	.022	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	11	19	.17	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	126	235	1.3	.0	.0	.0	.0

CAL YR 1987 TOTAL 1518.30 MEAN 4.16 MAX 458 MIN .00 AC-FT 3010
WTR YR 1988 TOTAL 182.31 MEAN .50 MAX 19 MIN .00 AC-FT 362

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR											
08...	1510	0.64	665	--	1.0	1.5	--	--	--	--	--
31...	1255	10	780	7.10	2.0	3.0	260	62	26	57	31
APR											
19...	1145	0.66	1600	--	6.0	6.0	--	--	--	--	--
MAY											
12...	1030	0.01	2330	7.00	15.0	15.0	840	170	100	270	41
31...	1415	0.02	2190	--	29.0	28.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
31...	2	7.3	140	220	25	0.10	13	495	496	14.0	0.67
MAY											
12...	4	14	300	990	100	0.20	8.1	1900	1830	0.05	2.58

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)
MAR										
31...	1	130	50	1	21	320	0.4	2	3	230
MAY										
12...	2	220	30	<1	90	290	0.2	2	1	880

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 current year.

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: Dec. 15 to Mar. 2 and Mar. 16-20. Records good except those for periods of estimated discharge, which are fair. 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.--48 years, 38.1 ft^3/s, 27,600 acre-ft/yr; median of yearly mean discharges, 36 ft^3/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft^3/s, Apr. 18, 1950, gage height, 14.48 ft, from flood-mark, 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.--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)
Mar. 24	1545	*229	*3.23	No other peak above base			

Minimum daily, 0.32 ft^3/s, Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	8.6	9.6	6.6	9.0	60	76	15	51	5.3	1.7	3.2
2	10	9.1	9.6	6.2	8.9	20	88	14	44	4.7	2.5	3.5
3	9.7	9.7	9.4	5.8	8.9	13	100	14	37	4.3	2.8	3.8
4	11	9.6	10	5.4	8.9	10	103	14	32	4.2	3.0	2.9
5	13	9.5	11	5.0	8.8	8.9	89	14	28	4.6	2.7	3.2
6	12	9.3	11	4.8	8.8	9.8	79	14	24	8.6	1.8	3.9
7	11	9.8	11	4.8	8.8	11	81	14	21	6.8	1.3	3.2
8	11	9.8	11	4.8	8.8	12	77	15	19	5.7	1.1	3.9
9	11	9.8	11	4.8	8.7	13	65	15	16	5.1	1.2	3.0
10	10	9.2	10	5.0	8.6	16	53	14	14	4.8	1.2	4.5
11	10	9.3	10	6.0	8.6	18	47	14	12	4.5	3.1	5.8
12	10	9.3	10	6.8	8.6	21	41	15	12	4.3	2.2	7.1
13	9.4	9.7	10	7.4	8.6	17	36	15	11	4.6	2.4	6.5
14	9.5	9.8	9.2	7.8	8.6	16	33	15	11	4.1	4.4	6.9
15	8.8	10	8.9	8.0	8.6	15	30	14	12	4.8	3.7	6.5
16	9.3	11	8.6	8.4	8.6	14	28	14	11	4.3	4.1	7.6
17	8.8	10	8.4	8.6	8.6	12	26	13	10	3.8	3.2	9.1
18	8.6	9.8	8.4	8.8	8.5	11	24	13	9.7	3.0	2.6	11
19	8.5	9.0	8.4	8.9	8.5	11	23	18	9.5	2.5	1.8	15
20	8.7	8.6	8.4	8.9	8.5	12	21	22	8.3	2.1	1.6	15
21	9.1	9.2	8.4	8.9	8.5	14	20	20	8.2	2.4	1.3	15
22	9.3	9.5	8.4	9.0	8.5	16	19	17	7.7	2.0	1.1	19
23	9.6	9.4	8.4	9.0	8.3	25	18	15	7.6	2.0	.68	19
24	9.5	8.6	8.0	9.1	8.2	165	18	14	7.1	2.2	.32	20
25	9.4	9.3	6.8	9.1	8.0	195	17	13	6.8	1.8	.46	21
26	9.7	9.3	6.8	9.0	9.0	108	17	12	6.3	1.5	.37	20
27	9.1	9.5	7.2	9.0	9.5	97	16	12	6.0	1.7	.60	21
28	8.5	9.8	7.2	9.0	10	90	15	14	5.6	1.4	1.2	20
29	9.2	9.8	7.2	9.0	100	84	15	97	5.1	1.1	2.1	21
30	9.4	9.8	7.0	9.0	---	86	14	96	5.3	1.5	2.4	21
31	8.9	---	6.8	9.0	---	80	---	65	---	1.2	2.8	---
TOTAL	302.0	285.1	276.1	231.9	343.9	1280.7	1289	671	458.2	110.9	61.73	322.6
MEAN	9.74	9.50	8.91	7.48	11.9	41.3	43.0	21.6	15.3	3.58	1.99	10.8
MAX	13	11	11	9.1	100	195	103	97	51	8.6	4.4	21
MIN	8.5	8.6	6.8	4.8	8.0	8.9	14	12	5.1	1.1	.32	2.9
AC-FT	599	565	548	460	682	2540	2560	1330	909	220	122	640

CAL YR 1987 TOTAL 23618.2 MEAN 64.7 MAX 1200 MIN 6.7 AC-FT 46850
WTR YR 1988 TOTAL 5633.13 MEAN 15.4 MAX 195 MIN .32 AC-FT 11170

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
19...	1230	9.0	780	--	7.0	6.0	--	--	--	--	--
DEC											
08...	1440	11	820	--	0.0	2.5	--	--	--	--	--
FEB											
03...	1610	8.9	860	--	-22.0	1.0	--	--	--	--	--
MAR											
21...	1410	15	790	--	3.0	3.5	--	--	--	--	--
30...	1505	99	680	7.20	3.0	3.0	250	58	25	43	26
MAY											
12...	1335	14	760	--	18.0	15.0	--	--	--	--	--
JUN											
22...	1420	7.5	910	--	27.0	25.0	--	--	--	--	--
AUG											
05...	1040	2.9	730	7.40	23.0	20.0	330	78	33	41	21
SEP											
09...	1440	2.7	750	--	20.0	17.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	1	9.7	160	180	15	0.20	13	474	440	127	0.64
AUG											
05...	1	6.2	240	180	15	0.20	22	510	523	3.98	0.69

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)
MAR										
30...	2	200	40	<1	27	200	0.3	2	2	240
AUG										
05...	6	80	10	<1	30	120	0.3	2	<1	370

05085000 FOREST RIVER AT MINTO, ND

LOCATION.--Lat 48°16'10", long 97°22'10", in SE¼ sec.31, 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 mi^2, of which about 120 mi^2 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: Dec. 8 to Mar. 22. 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.--44 years, 50.0 ft^3/s, 36,220 acre-ft/yr; median of yearly mean discharges, 45 ft^3/s, 32,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,600 ft^3/s, Apr. 18, 1950, gage height, 11.80 ft from floodmarks, from rating curve extended above 7,200 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 27	1330	274	2.16	May 29	1145	*945	*3.71
Apr. 7	1515	245	2.11				

No flow Sept. 13-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	11	14	9.0	3.0	1.0	164	31	148	5.0	1.1	1.5
2	7.6	11	14	9.0	2.5	.89	172	30	101	5.0	1.2	1.3
3	7.6	11	13	9.0	2.0	2.2	173	29	78	4.7	1.1	.76
4	7.9	11	13	9.0	1.4	15	193	29	67	4.6	.91	.48
5	7.4	10	12	9.0	.70	30	220	27	59	5.0	.85	.34
6	7.7	10	12	8.5	.60	20	200	27	51	8.0	.83	.26
7	7.7	10	13	8.5	.50	15	207	27	40	11	.95	.18
8	9.2	9.5	13	8.0	.44	12	185	30	37	11	1.1	.13
9	8.9	7.5	13	8.0	.41	10	164	30	32	9.1	.99	.05
10	9.7	8.1	13	7.5	.37	8.0	132	26	29	7.0	.88	.02
11	9.6	8.9	13	7.0	.31	6.0	123	26	24	5.8	2.1	.02
12	11	12	13	6.5	.27	5.0	98	26	25	5.5	2.5	.01
13	12	15	13	6.0	.25	4.5	87	22	22	5.5	2.0	.00
14	13	13	12	5.5	.22	4.0	77	22	20	5.1	1.8	.00
15	13	12	12	5.5	.21	3.5	69	21	16	4.7	1.5	.00
16	13	12	12	5.5	.20	3.0	65	20	14	4.6	1.8	.00
17	14	12	11	5.5	.20	5.0	62	18	13	5.0	2.0	.00
18	15	10	11	5.5	.21	10	60	16	13	4.7	2.6	.00
19	18	10	10	5.5	.22	12	57	18	12	4.6	3.8	.00
20	17	8.6	10	5.5	.23	14	53	18	11	4.1	4.5	.00
21	18	9.8	10	5.5	.23	12	49	18	12	3.2	4.6	.00
22	17	10	10	5.5	.23	10	46	21	11	2.9	4.3	.00
23	18	13	10	5.5	.23	17	44	24	10	3.1	3.4	.00
24	19	13	9.5	5.5	.24	29	42	22	9.8	3.3	3.2	.05
25	20	12	9.5	5.0	.25	31	42	20	9.5	2.6	2.7	.16
26	17	12	9.5	5.0	.32	84	39	19	8.6	2.5	2.3	.24
27	9.6	12	9.5	4.5	.80	242	37	20	7.9	2.3	2.3	.56
28	9.1	13	9.5	4.5	1.7	184	36	28	7.1	2.0	2.2	.51
29	9.2	13	9.5	4.0	1.3	171	33	771	6.5	1.8	2.3	.46
30	9.1	13	9.5	4.0	---	134	32	482	5.6	1.6	2.0	.55
31	12	---	9.5	3.5	---	145	---	274	---	1.3	1.5	---
TOTAL	374.9	333.4	353.0	196.0	19.54	1240.09	2961	2192	900.0	146.6	65.31	7.58
MEAN	12.1	11.1	11.4	6.32	.67	40.0	98.7	70.7	30.0	4.73	2.11	.25
MAX	20	15	14	9.0	3.0	242	220	771	148	11	4.6	1.5
MIN	7.4	7.5	9.5	3.5	.20	.89	32	16	5.6	1.3	.83	.00
AC-FT	744	661	700	389	39	2460	5870	4350	1790	291	130	15

CAL YR 1987 TOTAL 35755.0 MEAN 98.0 MAX 2270 MIN 5.9 AC-FT 70920
WTR YR 1988 TOTAL 8789.42 MEAN 24.0 MAX 771 MIN .00 AC-FT 17430

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
05...	1600	7.2	680	--	9.0	10.0	--	--	--	--	--
DEC											
07...	1505	13	925	--	-2.0	1.0	--	--	--	--	--
FEB											
05...	1340	0.69	1540	--	-22.0	1.0	--	--	--	--	--
APR											
04...	1535	192	610	7.40	6.0	4.0	220	53	21	37	26
MAY											
13...	1125	21	820	--	6.0	12.0	--	--	--	--	--
31...	1215	288	450	--	29.0	24.0	--	--	--	--	--
JUN											
23...	1025	10	845	--	23.0	23.0	--	--	--	--	--
AUG											
05...	1300	0.73	900	8.00	25.0	25.0	380	83	41	61	25

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	1	8.6	150	140	18	0.10	16	388	385	201	0.53
AUG											
05...	1	10	270	180	57	0.20	18	617	614	1.22	0.84

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										
04...	2	150	40	<1	23	100	0.2	1	3	210
AUG										
05...	7	130	20	<1	50	50	0.5	2	1	450

05088500 HOMME RESERVOIR NEAR PARK RIVER, ND

LOCATION.--Lat 48°24'20", long 97°47'10", in SE¼NW¼ 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 National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth-filled 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, 2,920 acre-ft, Apr. 3, elevation, 1,080.40 ft; minimum, 1,602 acre-ft, Feb. 29, elevation, 1,072.19 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,076.40	2,218	--
Oct. 31	1,076.45	2,226	+08
Nov. 30	1,077.08	2,333	+107
Dec. 31	1,076.90	2,303	-30
CAL YR 1987	-	-	-212
Jan. 31	1,074.40	1,894	-409
Feb. 29	1,072.19	1,602	-292
Mar. 31	1,078.00	2,490	+888
Apr. 30	1,080.10	2,860	+370
May 31	1,080.05	2,850	-10
June 30	1,078.68	2,605	-245
July 31	1,077.24	2,360	-245
Aug. 31	1,076.33	2,206	-154
Sept. 30	1,076.13	2,172	-34
WTR YR 1988	-	-	-46

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND

LOCATION.--Lat 48°24'07", long 97°46'55", in SE¼ 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: Jan. 3-11, 15, 16, and Apr. 11-21. Records poor. Flow regulated by Homme Reservoir (station 05088500).

AVERAGE DISCHARGE.--39 years, 25.6 ft^3/s, 18,550 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 Oct. 1 to Dec. 3, 1949, Oct. 1-4, 1969, Sept. 21, 1970, July 1, 1974, and Sept. 10, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29 ft^3/s, Apr. 3, gage height, 23.39 ft; maximum gage height, 23.67 ft, Jan. 15, backwater from ice; no flow, Sept. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.29	.16	.13	5.5	6.6	1.8	1.6	2.7	3.1	3.7	1.9	.07
2	.32	.16	.13	4.8	6.6	1.1	2.8	3.0	3.4	3.7	1.9	.07
3	.28	.18	.13	4.6	6.6	.61	20	2.7	3.5	3.7	1.9	.07
4	.25	.15	.12	4.0	6.6	.82	25	2.5	3.5	3.7	2.2	.07
5	.35	.13	.12	4.0	6.6	1.1	25	1.7	3.5	3.9	2.3	.07
6	.36	.15	.12	4.2	6.3	1.1	20	1.6	3.7	4.1	2.5	.04
7	.32	.16	.12	4.0	6.3	1.1	18	2.8	3.7	4.0	2.7	.02
8	.34	.15	.13	4.0	6.3	1.1	18	6.5	3.7	4.0	2.8	.02
9	.37	.15	.14	4.0	6.3	.99	15	4.9	3.7	4.0	2.8	.01
10	.54	.13	.13	3.5	6.3	.99	14	2.5	3.7	4.0	2.8	.00
11	.26	.13	.12	3.0	6.3	1.0	10	3.5	3.8	3.4	3.0	.01
12	.29	.21	.12	2.4	6.3	.99	8.0	5.7	3.8	3.4	2.7	.05
13	.27	.16	.12	2.4	6.3	.99	7.0	2.9	3.8	3.4	1.1	.06
14	.22	.12	.12	2.2	6.3	1.0	6.0	4.4	3.8	3.5	1.2	.06
15	.20	.14	.11	7.0	6.3	1.0	5.5	4.3	3.8	3.5	2.3	.06
16	.20	.16	.11	8.0	6.3	1.1	5.0	2.5	3.8	3.5	2.3	.03
17	.18	.14	.09	8.4	6.3	1.1	4.8	2.5	3.8	3.0	2.4	.04
18	.17	.16	.09	8.1	6.6	1.1	4.6	2.8	3.8	2.8	2.3	.06
19	.18	.15	.10	7.8	4.3	1.1	4.5	5.7	3.8	2.8	1.8	.07
20	.20	.15	.10	7.3	2.3	1.1	4.5	4.0	3.8	2.8	.34	.07
21	.22	.14	3.0	7.1	2.1	1.1	4.0	3.4	3.8	2.7	.19	.07
22	.20	.20	7.1	7.3	2.1	1.2	4.4	3.3	4.0	1.9	.13	.07
23	.20	.20	7.3	7.3	2.0	1.3	4.4	3.3	4.0	1.8	.09	.06
24	.18	.17	7.7	7.2	2.0	1.4	7.0	3.0	4.0	1.8	.08	.03
25	.16	.16	8.6	7.0	1.9	1.4	5.5	2.9	4.0	1.9	.08	.01
26	.18	.19	7.5	7.0	2.0	1.3	1.2	2.8	4.0	1.9	.07	.01
27	.20	.17	6.6	7.0	2.0	1.4	1.0	2.8	3.7	2.0	.07	.01
28	.22	.14	5.9	7.0	2.0	1.5	1.1	3.0	3.7	2.0	.07	.01
29	.21	.13	5.3	6.8	1.9	1.4	1.3	3.0	3.7	2.1	.07	.01
30	.18	.13	5.3	6.8	---	1.4	1.8	3.1	3.7	2.4	.07	.03
31	.17	---	4.9	6.8	---	1.5	---	3.1	---	2.1	.07	---
TOTAL	7.71	4.67	71.55	176.5	139.8	36.09	251.0	102.9	112.1	93.5	44.23	1.26
MEAN	.25	.16	2.31	5.69	4.82	1.16	8.37	3.32	3.74	3.02	1.43	.042
MAX	.54	.21	8.6	8.4	6.6	1.8	25	6.5	4.0	4.1	3.0	.07
MIN	.16	.12	.09	2.2	1.9	.61	1.0	1.6	3.1	1.8	.07	.00
AC-FT	15	9.3	142	350	277	72	498	204	222	185	88	2.5

CAL YR 1987 TOTAL 11513.55 MEAN 31.5 MAX 1900 MIN .09 AC-FT 22840
WTR YR 1988 TOTAL 1041.31 MEAN 2.85 MAX 25 MIN .00 AC-FT 2070

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
09...	1210	0.38	860	--	4.0	5.0	--	--	--	--	--
DEC											
08...	1110	0.13	1050	--	0.0	2.0	--	--	--	--	--
JAN											
29...	0945	7.0	635	--	-7.0	2.0	--	--	--	--	--
MAR											
29...	1135	1.4	1060	--	1.0	0.5	--	--	--	--	--
APR											
22...	1545	4.4	720	--	7.0	8.0	--	--	--	--	--
MAY											
12...	1520	7.2	740	--	15.0	15.0	--	--	--	--	--
JUN											
22...	0945	4.0	770	7.10	22.0	18.0	320	80	30	44	22
AUG											
04...	1550	2.0	755	--	23.0	23.0	--	--	--	--	--
SEP											
09...	1000	0.01	790	--	17.0	17.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
JUN											
22...	1	8.9	230	190	17	0.30	14	537	526	5.74	0.73

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)
JUN										
22...	7	70	20	<1	40	2800	0.2	2	<1	460

05090000 PARK RIVER AT GRAFTON, ND

LOCATION.--Lat 48°25'29", long 97°24'42", in NE¼ sec.13, T.157 N., R.53 W., Walsh County, Hydrologic Unit 09020310, on right bank at the upstream corner of 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: Jan. 6-14, 20-24, and Feb. 3-11. Records good except those below 1 ft^3/s, which are poor. Flow regulated by Homme Reservoir (station 05088500) and several small reservoirs.

AVERAGE DISCHARGE.--57 years, 57.1 ft^3/s, 41,370 acre-ft/yr; median of yearly mean discharges, 43 ft^3/s, 31,200 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, 143 ft^3/s, Apr. 6, gage height, 7.79 ft; no flow, July 31, Aug. 1, 9-12, and 27 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.10	.17	.04	.50	1.1	33	4.4	16	1.2	.00	.00
2	.04	.10	.20	.03	.20	1.0	42	4.6	27	1.4	.02	.00
3	.03	.07	.21	.02	.15	.80	38	5.3	22	1.6	.09	.00
4	.02	.08	.17	.01	.10	.80	51	5.5	16	2.0	.07	.00
5	.01	.03	.17	.00	.07	1.4	114	6.2	11	2.3	.07	.00
6	.01	.07	.17	.00	.07	1.7	119	4.7	7.0	4.0	.08	.00
7	.01	.09	.19	.00	.07	1.1	129	4.7	5.0	3.6	.05	.00
8	.00	.01	.28	.00	.07	.81	120	4.8	3.2	2.1	.01	.00
9	.00	.02	.25	.00	.06	.80	102	6.2	2.7	.96	.00	.00
10	.00	.01	.22	.00	.06	.88	80	8.8	2.7	.63	.00	.00
11	.00	.04	.29	.00	.06	.79	69	7.6	2.5	.74	.00	.00
12	.02	.08	.26	.00	.06	.36	61	5.6	2.5	.79	.00	.00
13	.08	.09	.25	.00	.06	.52	46	3.8	2.8	1.0	.04	.00
14	.07	.19	.22	.00	.06	.48	36	5.1	3.0	.71	.16	.00
15	.07	.27	.17	.00	.06	.48	33	4.2	3.4	.70	.54	.00
16	.20	.21	.24	.00	.06	.53	29	4.5	3.8	.61	1.1	.00
17	.12	.15	.18	.00	.06	.60	24	7.0	4.0	.63	.59	.00
18	.14	.10	.19	.00	.10	.60	22	4.1	3.7	.67	.46	.00
19	.15	.10	.22	.00	.50	.63	18	4.4	4.4	.60	.55	.00
20	.18	.06	.17	.00	1.0	.53	13	7.3	3.3	.55	.69	.00
21	.11	.05	.17	.00	3.2	.47	14	12	3.3	.53	.53	.00
22	.19	.05	.17	.00	3.0	.61	11	14	2.7	.48	.25	.00
23	.23	.07	.20	.00	2.4	2.2	11	8.8	2.5	.44	.15	.00
24	.10	.06	.17	.00	1.6	4.8	12	5.2	2.3	.49	.12	.00
25	.08	.06	.14	.00	.60	3.9	8.2	3.9	1.9	.45	.05	.00
26	.09	.10	.08	.10	.80	1.6	16	3.1	1.5	.43	.01	.00
27	.02	.10	.11	.20	1.7	4.9	11	2.9	1.6	.40	.00	.00
28	.04	.10	.20	.50	3.2	22	6.0	29	1.4	.21	.00	.00
29	.08	.10	.21	1.0	1.5	14	4.5	36	1.3	.13	.00	.00
30	.05	.15	.20	.90	---	25	4.3	13	1.2	.03	.00	.00
31	.07	---	.05	.80	---	24	---	8.0	---	.00	.00	---
TOTAL	2.22	2.71	5.92	3.60	21.37	119.39	1277.0	244.7	165.7	30.38	5.63	0.00
MEAN	.072	.090	.19	.12	.74	3.85	42.6	7.89	5.52	.98	.18	.00
MAX	.23	.27	.29	1.0	3.2	25	129	36	27	4.0	1.1	.00
MIN	.00	.01	.05	.00	.06	.36	4.3	2.9	1.2	.00	.00	.00
AC-FT	4.4	5.4	12	7.1	42	237	2530	485	329	60	11	.0

CAL YR 1987 TOTAL 35080.12 MEAN 96.1 MAX 3160 MIN .00 AC-FT 69580
WTR YR 1988 TOTAL 1878.62 MEAN 5.13 MAX 129 MIN .00 AC-FT 3730

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
JAN											
29...	1305	1.0	--	--	-8.0	--	--	--	--	--	--
FEB											
05...	1050	0.07	--	--	-22.0	--	--	--	--	--	--
APR											
06...	1445	133	560	7.40	10.0	5.0	180	44	16	44	34
a06...	1446	133	560	7.40	10.0	5.0	180	45	16	44	33
MAY											
13...	0930	3.4	1420	--	0.0	12.0	--	--	--	--	--
JUN											
23...	1255	2.3	1180	7.50	24.0	24.0	--	--	--	--	--
AUG											
04...	1230	0.02	1830	7.60	24.0	24.0	360	74	42	280	62
a04...	1231	0.02	1830	7.60	24.0	24.0	360	74	42	270	61

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	1	8.9	130	100	41	0.10	13	324	348	116	0.44
a06...	1	9.3	115	110	36	0.20	13	351	343	126	0.48
AUG											
04...	7	14	300	300	270	0.80	16	1180	1180	0.06	1.60
a04...	6	16	293	300	280	0.60	18	1200	1180	0.06	1.63

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										
06...	2	200	80	1	26	280	0.4	1	2	200
a06...	2	90	54	<5	23	300	0.1	2	<1	180
AUG										
04...	8	620	10	<1	100	<10	0.2	4	<1	640
a04...	8	660	4	<5	90	7	0.2	4	<1	520

a - Split sample analysis for quality assurance.

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND

LOCATION.--Lat 48°34'20", long 97°08'50", in SE¼SE¼SE¼ 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: Dec. 21 to Apr. 22. Records good except those for period of estimated daily discharges, which are fair. Some regulation by reservoirs on tributaries.

AVERAGE DISCHARGE.--39 years (water years 1950-88), 3,840 ft^3/s, 2,782,000 acre-ft/yr; median of yearly mean discharges, 3,800 ft^3/s, 2,750,000 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, 13,900 ft^3/s, Apr. 7, gage height, 22.12 ft; minimum daily, 144 ft^3/s, Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	983	818	827	608	455	620	8120	1670	2520	532	195	210
2	1040	823	823	602	455	630	8620	1630	2320	492	183	204
3	982	833	815	600	455	640	9130	1570	1990	432	175	199
4	897	803	777	575	455	660	9830	1530	1740	383	169	192
5	880	814	746	537	455	670	10800	1510	1550	362	187	183
6	873	805	739	530	462	690	12400	1470	1380	383	227	179
7	842	787	739	510	468	720	13800	1450	1220	401	220	177
8	813	799	739	490	475	750	13300	1370	1070	437	234	166
9	790	815	747	460	482	800	12600	1280	983	411	247	154
10	787	821	751	440	489	880	11600	1270	940	389	266	148
11	736	809	747	440	489	1030	10300	1270	915	374	278	144
12	704	804	724	420	489	1190	8620	1270	821	360	314	145
13	661	788	687	413	500	1520	6920	1250	740	333	324	174
14	665	767	672	399	510	2250	5660	1250	641	321	319	184
15	676	756	672	416	515	3100	4800	1240	642	314	316	186
16	686	767	672	434	520	3720	4230	1220	639	317	298	186
17	711	785	672	421	525	3710	3840	1220	618	324	306	184
18	700	798	667	415	530	3580	3590	1220	594	321	323	184
19	714	808	663	415	530	3240	3300	1220	600	309	340	186
20	692	699	663	415	530	2860	3130	1200	623	300	361	199
21	680	684	660	420	530	2620	2900	1170	625	295	393	228
22	666	720	660	420	530	2450	2790	1130	608	295	366	252
23	679	676	650	420	540	2340	2660	1060	599	302	339	370
24	685	595	650	430	550	2300	2500	1000	586	311	324	586
25	705	597	640	425	556	2330	2310	999	570	335	317	786
26	694	669	630	420	582	2580	2180	999	587	336	298	855
27	723	736	630	440	584	3280	2030	1040	571	335	272	855
28	721	795	630	445	600	4310	1980	1210	548	318	245	841
29	723	823	630	450	620	5490	1840	2270	582	280	231	792
30	763	827	630	448	---	6580	1730	3260	571	250	224	713
31	801	---	620	448	---	7450	---	2980	---	227	220	---
TOTAL	23672	23021	21572	14306	14881	74990	187510	44228	28393	10779	8511	9862
MEAN	764	767	696	461	513	2419	6250	1427	946	348	275	329
MAX	1040	833	827	608	620	7450	13800	3260	2520	532	393	855
MIN	661	595	620	399	455	620	1730	999	548	227	169	144
AC-FT	46950	45660	42790	28380	29520	148700	371900	87730	56320	21380	16880	19560

CAL YR 1987 TOTAL 1263541 MEAN 3462 MAX 27500 MIN 595 AC-FT 2506000
WTR YR 1988 TOTAL 461725 MEAN 1262 MAX 13800 MIN 144 AC-FT 915800

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1730	849	875	--	9.0	11.0	--	--	--	--	--
NOV											
09...	1545	805	1200	--	2.0	3.0	--	--	--	--	--
JAN											
15...	1300	420	1090	--	-11.0	0.5	--	--	--	--	--
FEB											
26...	1410	587	870	--	3.0	0.5	--	--	--	--	--
APR											
08...	1630	13100	505	7.40	15.0	5.5	220	50	22	24	19
MAY											
09...	1510	1240	790	--	17.0	17.0	--	--	--	--	--
JUN											
20...	1515	800	780	--	28.0	24.0	--	--	--	--	--
JUL											
12...	1140	360	870	--	26.0	26.0	--	--	--	--	--
AUG											
04...	1020	170	1020	8.00	22.0	24.0	320	67	37	99	39
SEP											
08...	1635	156	910	--	18.0	18.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	0.7	6.8	170	87	27	0.20	12	351	330	12400	0.48
AUG											
04...	2	8.9	250	130	130	0.30	13	627	641	288	0.85

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										
08...	3	190	110	1	22	20	0.6	2	3	230
AUG										
04...	6	200	10	<1	50	<10	0.3	4	<1	490

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND
(International gaging station)

LOCATION.--Lat 48° 7'10", long 99°25'35", in SE1/4SW1/4 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 mi^2, 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.--Estimated daily discharges: Apr. 1-2. Records good.

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

AVERAGE DISCHARGE.--27 years, 3.30 ft^3/s, 2,390 acre-ft/yr; median of yearly mean discharges, 2.2 ft^3/s, 1,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 1,200 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 4	----	*4.6	*6.12				

No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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	.40	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	1.7	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	1.9	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	1.2	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.90	.01	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.71	.01	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.44	.01	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.27	.01	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.19	.01	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.13	.01	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.09	.01	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.06	.01	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.03	.01	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.03	.01	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.01	.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	.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	9.72	0.12	0.00	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.32	.004	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.00	1.9	.01	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	19	.2	.0	.0	.0	.0

CAL YR 1987 TOTAL 1112.79 MEAN 3.05 MAX 165 MIN .00 AC-FT 2210
WTR YR 1988 TOTAL 9.84 MEAN .027 MAX 1.9 MIN .00 AC-FT 20

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
APR											
05...	1155	1.7	462	7.60	9.5	2.0	180	42	18	14	14
19...	1600	0.01	760	--	14.0	8.0	--	--	--	--	--
MAY											
11...	1145	0.01	1140	6.30	17.0	12.0	550	130	55	50	16

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	0.5	12	120	91	11	0.10	12	272	273	1.24	0.37
MAY											
11...	1	12	350	290	22	0.20	16	824	787	0.02	1.12

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										
05...	3	120	110	<1	21	220	<0.1	2	2	200
MAY										
11...	2	130	40	<1	60	510	0.3	1	1	550

05098800 CYPRESS CREEK NEAR SARLES, ND
(International gaging station)

LOCATION.--Lat 48°56'35", long 98°57'05", in SW1/4SE1/4 sec.9, T.163 N., R.64 W., Cavalier County, Hydrologic Unit 09020313, on right bank 150 ft downstream from twin multiplate culverts on county highway, and 2.5 mi east of Sarles.

DRAINAGE AREA.--71 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1961 to current year. Prior to October 1973, published as Long River near Sarles.

GAGE.--Water-stage recorder. Elevation of gage is 1,545 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 26 to Mar. 28. Records good except those for period 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.--27 years, 5.69 ft^3/s, 4,120 acre-ft/yr; median of yearly mean discharges, 4.9 ft^3/s, 3,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,000 ft^3/s, Apr. 21, 1979, gage height, 10.35 ft, backwater from ice and snow; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge 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)
Mar. 29	----	*6.3	*3.00				

No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.00	.00	.00	.00	.00	4.6	.00	.00	.00	.00	.00
2	.06	.00	.00	.00	.00	.00	4.2	.00	.00	.00	.00	.00
3	.05	.00	.00	.00	.00	.00	4.8	.00	.00	.00	.00	.00
4	.04	.00	.00	.00	.00	.00	4.6	.00	.00	.00	.00	.00
5	.03	.00	.00	.00	.00	.00	3.8	.00	.00	.00	.00	.00
6	.03	.00	.00	.00	.00	.10	3.1	.00	.00	.00	.00	.00
7	.03	.00	.00	.00	.00	.25	2.2	.01	.00	.00	.00	.00
8	.01	.00	.00	.00	.00	.50	1.7	.01	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.70	1.3	.01	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	1.0	1.3	.01	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	3.5	.98	.01	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	2.0	.53	.01	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	1.7	.25	.01	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	1.2	.16	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	1.0	.14	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.90	.12	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	1.1	.10	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	1.2	.10	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	1.1	.08	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.90	.08	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.75	.07	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	1.1	.06	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	1.6	.05	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	2.9	.04	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	3.1	.04	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	2.3	.03	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	2.2	.02	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	2.9	.01	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	5.0	.01	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	6.0	.01	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	5.0	---	.00	---	.00	.00	---
TOTAL	0.32	0.00	0.00	0.00	0.00	50.00	34.48	0.07	0.00	0.00	0.00	0.00
MEAN	.010	.00	.00	.00	.00	1.61	1.15	.002	.00	.00	.00	.00
MAX	.07	.00	.00	.00	.00	6.0	4.8	.01	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
AC-FT	.6	.0	.0	.0	.0	99	68	.1	.0	.0	.0	.0

CAL YR 1987 TOTAL 2126.92 MEAN 5.83 MAX 490 MIN .00 AC-FT 4220
WTR YR 1988 TOTAL 84.87 MEAN .23 MAX 6.0 MIN .00 AC-FT 168

05098800 CYPRESS CREEK NEAR SARLES, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
08...	0845	0.01	845	--	5.0	5.5	--	--	--	--	--
MAR											
10...	1215	0.95	345	--	10.0	2.0	--	--	--	--	--
APR											
05...	1350	3.7	482	7.60	14.0	6.0	180	47	16	24	21
19...	1420	0.07	700	--	8.0	11.0	--	--	--	--	--
MAY											
11...	1000	0.01	930	6.70	10.0	12.0	370	89	35	69	28

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	0.8	11	165	87	12	0.10	23	300	319	2.98	0.41
MAY											
11...	2	11	300	190	31	0.20	18	641	626	0.02	0.87

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										
05...	3	130	70	<1	20	80	0.1	1	2	230
MAY										
11...	4	150	40	<1	50	230	0.2	1	1	460

05099100 SNOWFLAKE CREEK NEAR SNOWFLAKE, MAN
(International gaging station)

LOCATION.--Lat 49°01'17", long 98°36'13", in SW1/4 sec.10, T.1, R.9 W., 1st meridian, at traffic bridge, 2.5 mi east, and 1.5 mi south of Snowflake.

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.--27 years, 15.1 ft^3/s, 10,900 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, 1229.94 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29 ft^3/s, Apr. 3, gage height, 1225.34 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.01	.00	.00	.00	.84	3.6	.11	.00	.00	.00	.00
2	.06	.01	.00	.00	.00	.99	9.4	.13	.00	.00	.00	.00
3	.05	.02	.00	.00	.00	.36	18	.13	.00	.00	.00	.00
4	.04	.01	.00	.00	.00	.82	18	.12	.00	.00	.00	.00
5	.04	.00	.00	.00	.00	4.2	7.9	.11	.00	.00	.00	.00
6	.04	.00	.00	.00	.00	3.0	3.8	.08	.00	.00	.00	.00
7	.02	.00	.00	.00	.00	1.6	2.2	.10	.00	.00	.00	.00
8	.02	.00	.00	.00	.00	1.7	2.1	.14	.00	.00	.00	.00
9	.01	.00	.00	.00	.00	2.0	3.9	.12	.00	.00	.00	.00
10	.01	.00	.00	.00	.00	4.3	3.4	.08	.00	.00	.00	.00
11	.01	.00	.00	.00	.00	1.8	2.7	.07	.00	.00	.00	.00
12	.00	.01	.00	.00	.00	1.2	2.7	.10	.00	.00	.00	.00
13	.00	.02	.00	.00	.00	.39	2.3	.09	.00	.00	.00	.00
14	.00	.03	.00	.00	.00	.25	1.6	.07	.00	.00	.00	.00
15	.00	.04	.00	.00	.00	.18	1.1	.08	.00	.00	.00	.00
16	.00	.04	.00	.00	.00	.14	.89	.07	.00	.00	.00	.00
17	.00	.02	.00	.00	.00	.11	.75	.05	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.07	.64	.04	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.04	.55	.05	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.04	.48	.04	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.10	.44	.04	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.64	.39	.04	.00	.00	.00	.00
23	.01	.00	.00	.00	.00	1.9	.32	.02	.00	.00	.00	.00
24	.01	.00	.00	.00	.00	4.7	.25	.00	.00	.00	.00	.00
25	.02	.00	.00	.00	.00	3.5	.22	.00	.00	.00	.00	.00
26	.04	.00	.00	.00	.00	1.2	.18	.00	.00	.00	.00	.00
27	.04	.00	.00	.00	.57	1.9	.17	.00	.00	.00	.00	.00
28	.04	.00	.00	.00	1.2	1.4	.16	.00	.00	.00	.00	.00
29	.03	.00	.00	.00	.60	1.2	.13	.00	.00	.00	.00	.00
30	.03	.00	.00	.00	---	2.0	.11	.00	.00	.00	.00	.00
31	.02	---	.00	.00	---	2.3	---	.00	---	.00	.00	---
TOTAL	0.62	0.21	0.00	0.00	2.37	44.87	88.38	1.88	0.00	0.00	0.00	0.00
MEAN	.020	.007	.00	.00	.082	1.45	2.95	.061	.00	.00	.00	.00
MAX	.08	.04	.00	.00	1.2	4.7	18	.14	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.04	.11	.00	.00	.00	.00	.00
AC-FT	1.2	.4	.0	.0	4.7	89	175	3.7	.0	.0	.0	.0

CAL YR 1987 TOTAL 9360.42 MEAN 25.6 MAX 394 MIN .00 AC-FT 18570
WTR YR 1988 TOTAL 138.33 MEAN .38 MAX 18 MIN .00 AC-FT 274

05099150 MOWBRAY CREEK NEAR MOWBRAY, MAN
(International gaging station)

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

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, 55 ft^3/s, Apr. 3, gage height, 1,530.80 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	.58	.11	.00	.00	.00	10	.55	.00	.00	.00	.00
2	5.4	.50	.11	.00	.00	.00	20	.40	.00	.00	.00	.00
3	2.7	.45	.11	.00	.00	.00	39	.25	.00	.00	.00	.00
4	2.2	.39	.11	.00	.00	.00	35	.10	.00	.00	.00	.00
5	1.7	.17	.11	.00	.00	.19	24	.00	.00	.00	.00	.00
6	1.8	.20	.11	.00	.00	.96	22	.00	.00	.00	.00	.00
7	2.8	.20	.11	.00	.00	.04	17	.14	.00	.00	.00	.00
8	4.0	.11	.11	.00	.00	.04	13	.09	.00	.00	.00	.00
9	4.4	.09	.07	.00	.00	.04	7.4	.02	.00	.00	.00	.00
10	4.4	.05	.04	.00	.00	1.1	5.1	.00	.00	.00	.00	.00
11	3.7	.04	.04	.00	.00	.62	4.3	.00	.00	.00	.00	.00
12	3.1	.09	.04	.00	.00	.99	3.4	.00	.00	.00	.00	.00
13	2.4	3.1	.04	.00	.00	1.1	2.6	.00	.00	.00	.00	.00
14	1.9	3.0	.00	.00	.00	.04	2.3	.00	.00	.00	.00	.00
15	1.6	2.4	.00	.00	.00	.04	2.5	.00	.00	.00	.00	.00
16	1.4	2.0	.00	.00	.00	.04	2.6	.00	.00	.00	.00	.00
17	1.1	1.5	.00	.00	.00	1.9	2.5	.00	.00	.00	.00	.00
18	.93	1.1	.00	.00	.00	3.3	2.4	.00	.00	.00	.00	.00
19	.70	.96	.00	.00	.00	3.0	2.2	.00	.00	.00	.00	.00
20	.65	.47	.00	.00	.00	.79	1.9	.00	.00	.00	.00	.00
21	.45	.33	.00	.00	.00	.69	2.5	.00	.00	.00	.00	.00
22	.36	.29	.00	.00	.00	1.1	4.7	.00	.00	.00	.00	.00
23	.49	.14	.00	.00	.00	4.6	4.2	.00	.00	.00	.00	.00
24	1.2	.14	.00	.00	.00	8.1	3.2	.00	.00	.00	.00	.00
25	1.2	.14	.00	.00	.00	3.3	2.2	.00	.00	.00	.00	.00
26	1.1	.14	.00	.00	.00	2.0	1.8	.00	.00	.00	.00	.00
27	.81	.11	.00	.00	.00	2.6	1.4	.00	.00	.00	.00	.00
28	.69	.11	.00	.00	1.5	3.0	1.1	.00	.00	.00	.00	.00
29	.80	.11	.00	.00	1.4	4.4	.90	.00	.00	.00	.00	.00
30	.81	.11	.00	.00	---	4.6	.69	.00	.00	.00	.00	.00
31	.73	---	.00	.00	---	4.9	---	.00	---	.00	.00	---
TOTAL	58.12	19.02	1.11	0.00	2.90	53.48	241.89	1.55	0.00	0.00	0.00	0.00
MEAN	1.87	.63	.036	.00	.10	1.73	8.06	.050	.00	.00	.00	.00
MAX	5.4	3.1	.11	.00	1.5	8.1	39	.55	.00	.00	.00	.00
MIN	.36	.04	.00	.00	.00	.00	.69	.00	.00	.00	.00	.00
AC-FT	115	38	2.2	.0	5.8	106	480	3.1	.0	.0	.0	.0

CAL YR 1987 TOTAL 4834.10 MEAN 13.2 MAX 787 MIN .00 AC-FT 9590
WTR YR 1988 TOTAL 378.07 MEAN 1.03 MAX 39 MIN .00 AC-FT 750

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, on left bank 0.2 mi downstream from bridge, and 3 mi northeast of Windygates.

DRAINAGE AREA.--3,020 mi^2.

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.

REMARKS.--Records fair.

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.--26 years, 198 ft^3/s, 143,500 acre-ft/yr; median of yearly mean discharges, 140 ft^3/s, 101,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft^3/s, Apr. 26, 1974, gage height, 1,121.52 ft; no flow in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 178 ft^3/s, Apr. 4, gage height, 1,106.75 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	35	14	1.6	.00	3.9	30	33	11	.11	.00	.00
2	65	33	15	1.4	.00	4.8	45	30	12	.09	.00	.00
3	63	32	18	1.2	.00	3.3	77	29	11	.08	.00	.00
4	61	29	21	.99	.00	7.5	142	28	9.0	.12	.00	.00
5	62	27	24	.78	.00	10	137	26	7.9	.13	.00	.00
6	58	27	27	.57	.00	13	134	25	6.9	.26	.00	.00
7	56	26	23	.42	.00	11	135	27	6.0	.69	.00	.00
8	63	24	24	.32	.00	13	123	30	5.0	.29	.00	.00
9	64	27	20	.21	.00	12	104	30	3.7	.07	.00	.00
10	60	27	14	.11	.00	12	89	28	4.5	.06	.00	.00
11	58	27	18	.07	.00	32	80	26	3.8	.04	.00	.00
12	58	27	16	.00	.00	29	76	31	4.4	.05	.00	.00
13	56	25	19	.00	.00	14	69	34	4.0	.13	.00	.00
14	52	24	21	.00	.00	11	63	35	3.5	.05	.00	.00
15	51	24	20	.00	.00	9.7	55	34	3.6	.01	.00	.00
16	49	22	17	.00	.00	8.8	52	34	2.7	.00	.00	.00
17	49	21	18	.00	.00	8.7	49	32	3.0	.00	.00	.00
18	48	26	18	.00	.00	8.0	47	32	3.1	.00	.00	.00
19	45	22	18	.00	.00	9.0	49	32	2.5	.00	.00	.00
20	43	23	16	.00	.00	9.9	42	32	2.8	.00	.00	.00
21	41	23	13	.00	.00	12	41	29	2.6	.00	.00	.00
22	42	20	11	.00	.00	14	41	27	2.5	.00	.00	.00
23	42	18	8.8	.00	.00	22	40	25	2.3	.00	.00	.00
24	41	21	10	.00	.00	34	40	23	.85	.00	.00	.00
25	40	24	5.8	.00	.00	36	39	22	.67	.00	.00	.00
26	38	23	8.4	.00	.04	31	38	20	.44	.00	.00	.00
27	36	19	7.9	.00	.18	35	36	20	.31	.00	.00	.00
28	36	17	7.2	.00	1.3	36	33	18	.38	.00	.00	.00
29	35	16	8.3	.00	3.3	35	36	18	.20	.00	.00	.00
30	35	15	8.2	.00	---	31	35	15	.12	.00	.00	.00
31	36	---	3.9	.00	---	28	---	13	---	.00	.00	---
TOTAL	1542	724	473.5	7.67	4.82	544.6	1977	838	120.77	2.18	0.00	0.00
MEAN	49.7	24.1	15.3	.25	.17	17.6	65.9	27.0	4.03	.070	.00	.00
MAX	65	35	27	1.6	3.3	36	142	35	12	.69	.00	.00
MIN	35	15	3.9	.00	.00	3.3	30	13	.12	.00	.00	.00
AC-FT	3060	1440	939	15	9.6	1080	3920	1660	240	4.3	.0	.0

CAL YR 1987 TOTAL 80524.3 MEAN 221 MAX 2440 MIN 1.2 AC-FT 159700
WTR YR 1988 TOTAL 6234.54 MEAN 17.0 MAX 142 MIN .00 AC-FT 12370

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 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to current year. 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: Nov. 18 to Apr. 2 and July 10 to Sept. 30. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--49 years, 226 ft^3/s, 163,700 acre-ft/yr; median of yearly mean discharges, 160 ft^3/s, 116,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,400 ft^3/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 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	----	----	a*3.67	Apr. 4	1630	*321	2.98

Minimum discharge, 0.0 ft^3/s, Jan. 25 to Feb. 25.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	38	24	9.0	.00	4.0	109	34	19	2.6	1.2	1.0
2	64	38	24	8.0	.00	4.0	131	33	20	3.0	1.2	1.2
3	69	37	24	7.0	.00	4.0	190	32	20	3.5	1.2	1.3
4	67	36	24	5.0	.00	5.0	258	32	18	3.3	1.2	1.3
5	64	35	23	4.0	.00	6.0	241	35	18	5.1	1.1	1.4
6	65	30	23	3.0	.00	8.0	208	37	17	4.6	1.1	1.4
7	62	30	23	2.0	.00	9.0	171	40	16	4.6	1.1	1.4
8	59	36	24	1.0	.00	7.0	160	49	14	4.3	1.1	1.5
9	63	42	24	.80	.00	10	132	48	13	3.9	1.0	1.7
10	66	36	25	.60	.00	15	108	45	11	3.9	1.0	2.0
11	63	33	25	.45	.00	60	91	44	10	3.9	1.0	2.8
12	60	36	24	.35	.00	45	81	45	8.9	3.9	1.0	2.9
13	58	36	22	.25	.00	42	69	48	8.9	3.8	1.0	3.1
14	56	31	19	.22	.00	40	61	53	8.5	3.8	1.0	3.0
15	54	34	17	.16	.00	38	55	54	10	3.8	1.0	3.1
16	52	34	16	.13	.00	36	53	52	9.0	3.8	1.0	3.1
17	51	29	15	.10	.00	40	50	48	7.3	3.7	1.0	3.2
18	49	29	15	.08	.00	50	46	43	6.7	3.6	1.0	3.2
19	49	29	15	.06	.00	45	44	48	5.6	3.2	1.1	3.2
20	46	28	15	.05	.00	40	43	45	4.7	3.0	1.4	3.2
21	44	27	15	.04	.00	40	40	45	4.6	2.8	1.4	3.1
22	45	27	15	.03	.00	44	40	42	4.2	2.5	1.3	3.0
23	46	27	15	.02	.00	50	38	40	4.0	2.2	1.3	3.0
24	45	27	14	.01	.00	100	37	38	4.2	2.0	1.3	3.0
25	45	26	14	.00	.00	95	37	36	4.1	1.8	1.3	2.9
26	45	26	14	.00	1.0	90	36	36	3.6	1.6	1.3	2.8
27	42	26	14	.00	2.0	75	34	35	3.4	1.4	1.2	2.7
28	40	26	13	.00	3.0	50	32	34	3.2	1.4	1.2	3.0
29	38	25	13	.00	4.0	103	32	34	3.2	1.3	1.2	3.1
30	37	25	12	.00	---	117	33	32	2.6	1.3	1.2	3.1
31	38	---	11	.00	---	104	---	27	---	1.3	1.1	---
TOTAL	1648	939	571	42.35	10.00	1376.0	2660	1264	282.7	94.9	35.5	74.7
MEAN	53.2	31.3	18.4	1.37	.34	44.4	88.7	40.8	9.42	3.06	1.15	2.49
MAX	69	42	25	9.0	4.0	117	258	54	20	5.1	1.4	3.2
MIN	37	25	11	.00	.00	4.0	32	27	2.6	1.3	1.0	1.0
AC-FT	3270	1860	1130	84	20	2730	5280	2510	561	188	70	148

CAL YR 1987 TOTAL 104076.6 MEAN 285 MAX 4420 MIN 4.0 AC-FT 206400
WTR YR 1988 TOTAL 8998.15 MEAN 24.6 MAX 258 MIN .00 AC-FT 17850

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
07...	1710	61	780	--	8.0	9.0	--	--	--	--	--
DEC											
04...	1055	24	950	--	-7.0	0.5	--	--	--	--	--
MAR											
11...	0950	66	560	--	-3.0	1.0	--	--	--	--	--
APR											
01...	1120	107	660	7.10	4.0	5.0	250	63	23	46	27
MAY											
10...	1555	45	830	--	17.0	18.0	--	--	--	--	--
JUN											
21...	1240	4.6	830	7.50	26.0	24.0	370	94	33	46	21
AUG											
02...	0825	1.2	710	--	19.0	20.0	--	--	--	--	--
SEP											
07...	0900	1.4	710	--	14.0	15.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
01...	1	9.8	200	150	15	0.20	18	436	444	126	0.59
JUN											
21...	1	9.8	300	170	18	0.40	28	586	580	7.33	0.80

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										
01...	2	200	30	<1	47	150	0.3	2	4	310
JUN										
21...	5	120	10	<1	.70	270	0.6	7	<1	570

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 mi^2, 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: Oct. 1-6, Dec. 15 to Feb. 26, July 5-7, and July 25 to Sept. 30. Records fair except those for period of estimated daily discharges, July 25 to Sept. 30, which are poor.

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

AVERAGE DISCHARGE.--80 years (1904-8, 1910-15, 1920-88), 191 ft^3/s, 138,400 acre-ft/yr; median of yearly mean discharges, 150 ft^3/s, 109,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s, Apr. 20, 1950, gage height, 21.58 ft, backwater from ice; from rating curve extended above 5,300 ft^3/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 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	----	*420	*8.74				

Minimum discharge, .03 ft^3/s, Sept. 21-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	52	26	6.5	3.0	3.3	123	59	38	7.1	.36	.34
2	72	52	26	6.4	2.9	3.7	138	59	35	7.7	.41	.31
3	71	52	26	6.3	2.8	3.9	167	58	32	7.5	.44	.30
4	70	52	25	6.2	2.6	3.8	257	55	29	6.8	.44	.26
5	68	50	25	6.1	2.4	4.7	364	53	27	3.5	.44	.22
6	71	46	26	6.0	2.3	6.6	396	54	25	.33	.44	.19
7	71	44	26	5.9	2.2	9.2	313	55	23	3.0	.44	.15
8	72	30	25	4.5	2.1	8.1	248	53	21	5.8	.40	.13
9	67	25	24	4.5	2.0	12	222	54	19	4.7	.38	.10
10	68	27	24	4.5	2.0	18	207	62	17	3.9	.36	.09
11	71	33	24	4.5	1.9	24	182	60	17	3.9	.34	.10
12	74	49	23	4.5	1.9	39	161	55	16	4.3	.32	.08
13	75	56	23	3.9	1.9	63	143	52	16	5.9	.35	.07
14	74	52	19	3.4	1.9	60	131	53	14	4.7	.52	.06
15	71	52	18	3.4	1.9	55	124	53	15	4.7	.53	.06
16	71	50	18	4.4	1.8	53	112	57	14	3.6	.52	.06
17	69	42	18	4.2	1.8	54	101	59	14	3.6	.52	.06
18	66	16	17	3.6	1.9	48	97	57	14	3.1	.50	.05
19	64	25	17	3.4	1.9	46	92	59	13	3.1	.50	.05
20	62	22	16	3.4	1.8	43	86	57	11	2.6	.48	.04
21	61	23	16	3.4	1.3	43	83	57	10	3.1	.48	.03
22	60	23	15	3.3	1.5	44	82	59	8.7	2.9	.48	.03
23	60	25	14	3.3	1.5	42	78	56	8.5	1.9	.46	.03
24	60	27	13	3.3	1.4	42	75	53	9.5	1.3	.46	.03
25	60	27	11	3.3	1.3	42	69	51	8.7	.43	.47	.03
26	60	26	11	3.3	1.5	45	67	48	9.1	.37	.46	.03
27	60	26	9.1	3.2	3.8	117	69	52	8.8	.33	.45	.03
28	58	26	8.8	3.1	4.2	132	66	45	8.2	.28	.45	.03
29	57	26	8.8	3.1	3.5	106	64	43	7.7	.26	.44	.03
30	55	26	7.6	3.1	---	102	61	43	6.9	.30	.40	.03
31	52	---	6.8	3.1	---	104	---	41	---	.34	.37	---
TOTAL	2041	1082	567.1	131.1	63.0	1377.3	4378	1672	496.1	101.34	13.61	3.02
MEAN	65.8	36.1	18.3	4.23	2.17	44.4	146	53.9	16.5	3.27	.44	.10
MAX	75	56	26	6.5	4.2	132	396	62	38	7.7	.53	.34
MIN	52	16	6.8	3.1	1.3	3.3	61	41	6.9	.26	.32	.03
AC-FT	4050	2150	1120	260	125	2730	8680	3320	984	201	27	6.0

CAL YR 1987 TOTAL 108548.6 MEAN 297 MAX 4580 MIN 5.6 AC-FT 215300
WTR YR 1988 TOTAL 11925.57 MEAN 32.6 MAX 396 MIN .03 AC-FT 23650

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
07...	1400	70	800	--	7.0	9.0	--	--	--	--	--
DEC											
09...	1305	25	990	--	0.0	2.0	--	--	--	--	--
JAN											
07...	1450	5.8	1150	--	-14.0	0.5	--	--	--	--	--
APR											
08...	0925	259	550	7.40	9.0	6.0	220	53	20	35	25
MAY											
10...	1230	64	820	--	12.0	14.0	--	--	--	--	--
JUN											
21...	0905	10	860	7.60	23.0	24.0	410	96	40	48	20
JUL											
12...	1420	4.7	--	--	26.0	23.0	--	--	--	--	--
12...	1505	4.0	850	--	30.0	24.0	--	--	--	--	--
AUG											
03...	1115	0.44	910	--	26.0	25.0	--	--	--	--	--
SEP											
08...	1250	0.13	905	--	17.0	16.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	1	7.8	180	120	13	0.20	23	364	378	255	0.50
JUN											
21...	1	12	300	190	28	0.30	26	626	622	17.6	0.85

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										
08...	2	180	30	1	39	30	0.3	4	3	280
JUN										
21...	6	130	20	<1	80	330	0.8	7	<1	620

05101000 TONGUE RIVER AT AKRA, ND

LOCATION.--Lat 48°46'42", long 97°44'43", in SW1/4 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 mi^2.

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: June 1 to Sept. 30. Records fair except those for period of estimated discharges, which are 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 ft^3/s, 15,500 acre-ft/yr; median of yearly mean discharges, 19 ft^3/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft^3/s, Apr. 18, 1950, gage height, 48.7 ft, from flood-marks, site and datum then in use, from rating curve extended above 1,500 ft^3/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, 38 ft^3/s, Apr. 6, gage height, 8.71 ft; minimum recorded daily discharge, 0.01 ft^3/s, June 24, may have been less during winter period when gage was not being operated.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						1.2	14	4.1	2.5	.04	.04	.15
2						1.1	15	4.8	2.2	.04	.04	.15
3						1.0	21	4.9	2.0	.03	.04	.14
4						.99	24	4.5	1.5	.02	.04	.14
5						1.0	30	4.2	1.0	.20	.03	.13
6						.96	37	4.1	.80	2.0	.03	.13
7						.92	37	8.0	.60	2.2	.03	.13
8						1.3	33	15	.45	1.9	.03	.13
9						1.6	28	13	.30	1.5	.02	.12
10						2.5	23	11	.20	1.0	.02	.10
11						4.2	19	10	.15	.80	.02	.40
12						4.0	17	11	.12	.60	.02	.50
13						3.8	13	8.9	.10	.80	.02	.40
14						3.5	10	7.8	.15	.60	.70	.25
15						3.3	11	6.7	.50	.50	.60	.20
16						3.0	12	5.3	.45	.40	.50	.18
17						4.0	9.9	4.6	.35	.30	.45	.17
18						3.8	8.3	5.4	.20	.20	.40	.15
19						3.7	7.6	9.6	.10	.15	.30	.40
20						3.5	6.5	9.7	.03	.12	.50	.35
21						3.5	6.0	9.2	.02	.09	.40	.35
22						3.7	5.2	8.5	.02	.08	.35	.34
23						3.9	4.4	8.0	.02	.07	.25	.32
24						4.8	5.1	6.5	.01	.06	.25	.30
25						10	4.3	5.5	.10	.05	.25	.30
26						13	4.0	4.3	.09	.05	.20	.30
27						14	4.2	4.0	.07	.05	.20	.28
28						15	4.3	3.6	.06	.04	.20	.26
29						16	4.0	3.2	.05	.05	.20	.25
30						15	3.8	2.9	.05	.04	.18	.30
31						15	---	2.7	---	.05	.15	---
TOTAL						163.27	421.6	211.0	14.19	14.03	6.46	7.32
MEAN						5.27	14.1	6.81	.47	.45	.21	.24
MAX						16	37	15	2.5	2.2	.70	.50
MIN						.92	3.8	2.7	.01	.02	.02	.10
AC-FT						324	836	419	28	28	13	15

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
07...	0930	7.5	560	--	-4.0	10.0	--	--	--	--	--
MAR											
01...	1350	1.2	820	--	2.0	3.0	--	--	--	--	--
APR											
01...	0820	14	550	7.50	1.0	5.0	250	68	19	24	17
MAY											
10...	0910	11	520	--	10.0	13.0	--	--	--	--	--
JUN											
21...	1600	0.02	650	7.40	26.0	18.0	260	69	22	23	16
AUG											
03...	1430	0.04	495	--	27.0	24.0	--	--	--	--	--
SEP											
08...	1000	0.13	500	--	17.0	16.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
01...	0.7	7.0	200	87	10	0.20	15	381	353	14.6	0.52
JUN											
21...	0.6	5.8	250	75	12	0.30	13	367	368	0.02	0.50

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										
01...	2	190	20	1	29	450	<0.1	1	2	280
JUN										
21...	4	80	10	1	30	550	0.8	4	<1	350

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., 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 700.00 ft above National Geodetic Vertical Datum of 1929, by Survey of Canada. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

REMARKS.--Estimated daily discharges: Nov. 26 to Apr. 3. Records good. Discharge partially regulated by reservoirs on tributaries.

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

AVERAGE DISCHARGE.--76 years (water years 1913-88), 3,390 ft^3/s, 2,456,000 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 daily discharge, 15,700 ft^3/s, Apr. 8; minimum daily, 195 ft^3/s, Sept. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1080	840	809	600	463	576	6110	1770	2630	742	273	248
2	1070	862	809	590	463	590	6600	1700	2350	735	253	241
3	1100	872	810	572	456	600	7060	1620	2180	696	239	235
4	1080	883	806	569	463	611	7770	1560	1960	639	229	231
5	1010	872	794	569	470	622	8900	1530	1730	593	220	225
6	982	869	788	551	477	639	11600	1510	1550	600	215	220
7	964	862	790	519	480	660	15000	1490	1410	625	218	214
8	929	844	788	487	484	699	15700	1480	1340	643	219	213
9	872	819	786	466	494	706	14500	1440	1190	646	222	208
10	855	844	771	448	501	717	13300	1420	1090	604	228	197
11	844	848	763	441	509	756	12100	1420	1020	551	238	198
12	809	855	755	438	512	837	10800	1410	985	509	246	199
13	777	858	737	438	516	1000	9320	1390	936	477	259	196
14	742	848	725	431	516	1380	7770	1390	862	427	278	195
15	720	833	702	420	523	2180	6430	1370	798	396	286	201
16	724	816	683	417	530	3100	5470	1350	745	371	294	208
17	735	809	682	420	533	3640	4770	1350	720	351	302	214
18	742	805	676	424	530	3740	4240	1340	713	344	315	221
19	749	833	669	431	530	3710	3780	1360	685	328	326	227
20	752	968	658	431	526	3500	3410	1340	660	320	337	223
21	745	883	650	431	526	3260	3120	1320	664	313	350	220
22	727	819	637	438	526	3060	2880	1290	678	309	360	228
23	713	883	626	445	523	2920	2690	1250	682	317	371	257
24	717	837	619	456	519	2850	2550	1190	692	331	378	321
25	720	784	617	456	530	2850	2410	1140	703	346	367	498
26	735	762	618	456	537	2850	2310	1110	710	364	334	717
27	749	750	615	456	544	3100	2200	1110	731	406	310	858
28	770	774	607	452	554	3670	2080	1150	745	413	285	897
29	777	800	596	448	562	4380	1970	1260	742	364	268	869
30	773	815	600	452	---	5090	1860	1930	738	320	259	791
31	802	---	603	459	---	5690	---	2780	---	289	253	---
TOTAL	25764	25147	21789	14611	14797	69983	198700	44770	32639	14369	8732	9970
MEAN	831	838	703	471	510	2258	6623	1444	1088	464	282	332
MAX	1100	968	810	600	562	5690	15700	2780	2630	742	378	897
MIN	713	750	596	417	456	576	1860	1110	660	289	215	195
AC-FT	51100	49880	43220	28980	29350	138800	394100	88800	64740	28500	17320	19780

CAL YR 1987 TOTAL 1515099 MEAN 4151 MAX 37400 MIN 596 AC-FT 3005000
WTR YR 1988 TOTAL 481271 MEAN 1315 MAX 15700 MIN 195 AC-FT 954600

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, 1,480 microsiemens, Nov. 12, 1987; minimum daily mean, 330 microsiemens, Apr. 10, 16 and 17, 1978.

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, 1,480 microsiemens, Nov. 12; minimum daily mean, 532 microsiemens, Apr. 9 and 10.

WATER TEMPERATURES: Maximum daily mean, 26.7°C, Aug. 16; minimum daily mean, 0.0°C, on several days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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)
OCT											
21...	1200	745	--	832	8.10	-1.5	4.5	19	12.8	99	8
NOV											
24...	1030	837	--	1080	8.40	-4.5	0.0	8.2	15.6	107	6
FEB											
24...	1310	--	532	870	7.80	-4.0	0.0	3.5	9.2	62	4
APR											
19...	1050	--	3600	688	8.40	7.0	7.5	88	11.7	98	4
JUN											
07...	1215	1410	--	912	8.40	34.0	29.0	120	5.4	71	70
AUG											
09...	1115	--	230	1190	8.70	25.0	23.5	62	8.0	95	36

DATE	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 WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
OCT											
21...	2100	310	69	33	53	27	1	7.6	254	310	0
NOV											
24...	10	360	78	39	83	33	2	7.9	370	416	17
FEB											
24...	420	370	83	40	50	22	1	8.0	176	215	0
APR											
19...	40	290	67	29	33	20	0.9	5.9	208	220	17
JUN											
07...	70	280	60	31	72	35	2	9.6	237	269	10
AUG											
09...	22	340	71	39	110	41	3	9.0	248	298	2

a - Joint sample collected with Environment Canada at 0955 hours to compare sampling methods. Analysis is available from ND District computer files.

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT 21...	110	61	0.30	10	491	502	0.67	988	<0.010	<0.100
NOV 24...	130	100	0.30	2.6	630	662	0.86	1420	<0.010	<0.100
FEB 24...	100	41	0.30	18	541	450	0.74	777	0.010	0.730
APR 19...	110	36	0.20	17	509	431	0.69	4950	0.040	0.690
JUN 07...	110	92	0.20	10	517	529	0.70	1970	0.060	0.420
AUG 09...	140	150	0.20	16	697	685	0.95	433	<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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 21...	0.020	0.030	0.04	0.80	0.100	<0.010	0.070	<10	3	56
NOV 24...	0.010	0.020	0.03	1.1	0.120	0.060	0.040	--	--	--
FEB 24...	0.230	0.340	0.44	1.1	0.140	0.120	0.120	<10	2	77
APR 19...	0.060	0.100	0.13	0.70	0.110	0.090	0.090	740	3	60
JUN 07...	0.110	0.200	0.26	1.0	0.130	0.090	0.050	--	--	--
AUG 09...	0.050	0.020	0.03	1.4	0.170	0.050	0.030	40	5	85

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 21...	<0.5	<1	2	<3	1	11	7	40	6	0.3
FEB 24...	<0.5	3	1	<3	3	13	<5	47	40	0.5
APR 19...	<0.5	<1	1	<3	13	--	<5	26	--	--
AUG 09...	<0.5	<1	<1	<3	7	44	<5	57	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 21...	<10	2	<1	<1.0	290	<6	3	--	--	--
NOV 24...	--	--	--	--	--	--	--	40	90	86
FEB 24...	<10	6	<1	<1.0	310	<6	20	25	36	93
APR 19...	<10	10	<1	<1.0	240	<6	12	270	2620	99
JUN 07...	--	--	--	--	--	--	--	245	932	100
AUG 09...	<10	5	1	<1.0	380	8	<3	101	63	95

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.6	4.6	.4	.2	.1	.3	.7	10.1	24.3	21.8	23.8	21.0
2	11.0	5.8	.4	.2	.1	.3	.6	10.6	25.8	21.8	22.8	21.3
3	10.4	5.9	.4	.2	.0	.2	.7	11.0	25.7	22.3	22.8	20.9
4	10.0	5.5	.4	.2	.1	.2	.6	11.0	25.4	23.0	23.5	20.9
5	9.5	4.3	.4	.2	.0	.2	1.3	10.8	24.7	24.5	23.5	20.9
6	8.4	3.1	.4	.2	.1	.3	2.1	11.9	23.8	24.5	24.0	20.0
7	7.7	2.4	.4	.2	.0	.3	2.5	13.5	25.3	24.6	24.5	19.6
8	7.2	1.9	.4	.2	.0	.3	3.3	13.7	25.7	25.5	24.9	19.0
9	7.4	1.9	.4	.2	.1	.3	4.4	15.0	25.5	25.1	25.1	18.6
10	6.0	2.5	.4	.2	.0	.3	4.6	16.2	25.0	23.5	25.1	18.0
11	5.6	2.6	.4	.1	.0	.3	5.0	16.6	24.6	22.3	25.1	17.0
12	6.0	2.9	.4	.1	.0	.2	5.7	15.1	24.0	22.6	26.0	16.5
13	6.9	2.8	.4	.1	.1	.2	6.3	13.7	22.2	22.3	25.7	16.8
14	7.0	3.1	.4	.1	.1	.3	6.4	12.8	19.7	22.4	25.7	17.4
15	7.2	3.4	.4	.1	.1	.2	6.5	13.1	18.8	22.2	26.4	18.0
16	6.6	3.0	.4	.1	.1	.2	7.0	11.6	18.6	22.3	26.7	18.3
17	6.2	2.5	.4	.1	.1	.2	7.2	14.3	20.8	22.7	26.2	18.4
18	5.8	2.4	.4	.1	.1	.2	7.1	16.9	22.7	22.7	25.9	18.0
19	5.4	2.0	.4	.1	.1	.2	7.2	17.0	22.3	23.3	25.5	16.4
20	5.1	1.6	.4	.1	.1	.2	7.2	18.4	22.4	22.3	25.2	15.8
21	4.0	1.3	.4	.0	.1	.2	7.2	18.1	24.0	23.5	25.0	12.7
22	3.3	1.0	.2	.0	.3	.2	7.2	17.9	24.4	24.0	24.4	13.4
23	2.7	1.0	.2	.1	.3	.2	7.4	19.3	23.0	24.0	23.4	13.7
24	2.4	1.0	.2	.1	.3	.3	7.8	20.0	22.5	25.4	22.3	14.3
25	2.4	.9	.2	.1	.3	.3	7.8	19.8	22.1	24.9	21.0	14.3
26	2.6	1.0	.2	.1	.3	.3	7.5	20.5	21.1	25.3	21.0	14.6
27	3.1	1.1	.2	.1	.3	.3	7.6	20.9	22.6	25.0	20.0	14.5
28	3.0	1.0	.2	.1	.3	.3	8.2	22.5	23.0	25.3	21.9	13.9
29	3.2	.9	.2	.0	.3	.3	8.9	22.8	23.0	25.1	21.7	13.5
30	3.2	1.0	.2	.1	---	.3	9.7	23.9	22.5	24.6	20.3	14.0
31	3.2	---	.2	.1	---	.3	---	24.2	---	24.5	20.5	---
MEAN	5.9	2.5	.3	.1	.1	.3	5.5	16.2	23.2	23.7	23.9	17.0

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	749	781	1250	1200	1100	818	715	762	690	879	1200	613
2	755	790	1190	1200	1090	813	675	763	782	866	1200	617
3	755	827	1200	1200	1090	809	598	765	1140	842	1200	618
4	757	894	1200	1200	1080	801	584	771	1010	840	1200	618
5	763	935	1190	1200	1070	812	578	762	943	848	1200	618
6	770	911	1190	1260	1110	810	611	757	866	745	1200	610
7	774	900	1200	1200	1060	805	604	699	873	612	1200	612
8	794	953	1200	1100	1060	790	570	818	879	758	1200	731
9	790	1080	1200	1200	1060	785	532	823	881	810	1170	738
10	840	1370	1200	1200	1070	786	532	830	906	829	1050	758
11	853	1200	1200	1070	1060	857	545	820	924	834	886	767
12	854	1480	1200	1090	1060	997	548	831	924	841	885	772
13	803	1200	1200	1100	1040	1030	567	829	931	853	906	782
14	802	1200	1200	1090	1010	990	588	887	896	867	886	801
15	817	1200	1200	1070	996	995	616	879	875	889	875	831
16	810	1170	1200	1200	1000	856	637	871	873	937	871	867
17	780	1180	1200	1200	1010	806	654	863	872	1020	862	874
18	773	1200	1200	1200	1010	683	668	883	898	1010	856	873
19	778	1170	1200	1200	1020	619	670	853	961	1080	848	854
20	773	1150	1200	1040	1020	614	688	830	960	1050	833	819
21	774	1140	1200	1050	960	630	693	845	902	1080	811	776
22	767	1150	1440	1090	890	632	700	834	914	1080	751	728
23	760	1140	1200	1200	895	623	713	789	903	1080	708	714
24	763	1120	1200	1200	890	628	717	782	895	1090	686	703
25	760	1120	1200	1150	853	634	717	831	884	1090	720	685
26	758	1160	1200	1170	837	645	714	856	895	1090	725	671
27	761	1160	1200	1150	847	654	710	877	912	1030	730	694
28	780	1130	1200	1070	852	680	721	915	915	1020	718	785
29	791	1110	1200	1200	833	704	737	909	931	1070	638	822
30	782	1110	1200	1200	---	736	757	879	911	1170	621	932
31	775	---	1200	1200	---	721	---	830	---	1200	623	---
MEAN	783	1100	1210	1160	996	767	645	827	905	949	912	743

05113360 LONG CREEK AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY, SASK
(International gaging station)

LOCATION.--Lat 49°00'01", long 103°21'08", in SE¼ sec.1, T.1, R.11 W., 2d meridian, Hydrologic Unit 09010001, and on right bank 10 mi south of Outram.

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.--29 years, 35.4 ft^3/s, 25,650 acre-ft/yr; median of yearly mean discharges, 17 ft^3/s, 12,300 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.--No flow for the entire year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CAL YR 1987 TOTAL 3421.42 MEAN 9.37 MAX 260 MIN .00 AC-FT 6790
WTR YR 1988 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .0

05113600 LONG CREEK NEAR NOONAN, ND
(International gaging station)

LOCATION.--Lat 48°58'52", long 103°04'34", near north line of NE¼ sec.1, T.163 N., R.96 W., Divide County, 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.--Estimated daily discharges: Jan. 16 to Mar. 28, Apr. 9-11, 29, and May 2 to June 2. Records fair except those for estimated daily discharges, which are poor.

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

AVERAGE DISCHARGE.--29 years, 46.0 ft^3/s, 33,300 acre-ft/yr; median of yearly mean discharges, 22 ft^3/s, 15,900 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)
May 2	----	*0.30	3.41	May 21	----	----	*3.71

No flow much of the time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.06	.04	.01	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.05	.14	.01	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.04	.17	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.01	.05	.15	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.03	.04	.12	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.06	.04	.10	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.08	.03	.12	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.10	.04	.14	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.12	.03	.12	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.15	.02	.10	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.14	.02	.09	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.12	.01	.08	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.10	.01	.07	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.09	.01	.10	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.08	.01	.10	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.07	.01	.08	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.08	.01	.07	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.10	.00	.06	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.12	.00	.06	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.13	.00	.07	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.16	.00	.08	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.18	.00	.07	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.20	.00	.06	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.20	.00	.05	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.18	.00	.05	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.17	.00	.04	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.16	.00	.04	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.14	.00	.04	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.12	.00	.03	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.10	.02	.03	.00	.00	.00	.00
31	.00	---	.00	.00	---	.07	---	.02	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	3.26	0.50	2.49	0.02	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.11	.017	.080	.001	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.20	.06	.17	.01	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	6.5	1.0	4.9	.04	.0	.0	.0

CAL YR 1987 TOTAL 5313.34 MEAN 14.6 MAX 316 MIN .00 AC-FT 10540
WTR YR 1988 TOTAL 6.27 MEAN .017 MAX .20 MIN .00 AC-FT 12

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR											
15...	1335	0.07	1040	--	3.5	0.5	--	--	--	--	--
30...	1145	0.09	675	--	0.0	1.5	--	--	--	--	--
APR											
14...	1025	0.01	1070	8.57	4.5	6.5	310	52	43	120	44
MAY											
03...	1100	0.16	1110	--	6.0	10.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
14...	3	15	320	240	21	0.20	12	739	693	0.02	1.01

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										
14...	3	100	50	<1	56	50	0.2	1	<1	290

05113750 EAST BRANCH SHORT CREEK RESERVOIR NEAR COLUMBUS, ND

LOCATION.--Lat 48o59'26", long 102o47'07", in SW1/4NW1/4 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, 800 acre-ft, Sept. 27, 29, 1988, gage height, 22.93 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,060 acre-ft, Oct. 3, gage height, 25.74 ft; minimum contents, 800 acre-ft, Sept. 27, 29, gage height, 22.93 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	25.71	1,060	--
Oct. 31	25.44	1,030	-30
Nov. 30	25.29	1,020	-10
Dec. 31	25.17	1,010	-10
CAL YR 1987	-	-	-180
Jan. 31	----	*1,000	-10
Feb. 29	25.21	1,010	+10
Mar. 31	25.28	1,020	+10
Apr. 30	25.04	990	-30
May 31	24.92	980	-10
June 30	24.27	920	-60
July 31	23.84	890	-30
Aug. 31	23.26	830	-60
Sept. 30	22.96	810	-20
WTR YR 1988	-	-	-250

* - Estimated

05113800 SHORT CREEK BELOW INTERNATIONAL BOUNDARY NEAR ROCHE PERCEE, SASK
(International gaging station)

LOCATION.--Lat 49°01'42", long 102°51'00", in SW1/4 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 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: Nov. 18 to Apr. 5. Records good except those for winter period, which are fair.

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

AVERAGE DISCHARGE.--28 years, 12.0 ft^3/s, 8,690 acre-ft/yr; median of yearly mean discharges, 4.8 ft^3/s, 3,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft^3/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, 0.32 ft^3/s, May 2, gage height, 2.97 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.04	.07	.00	.00	.00	.07	.18	.00	.00	.00	.00
2	.00	.04	.04	.00	.00	.00	.07	.21	.00	.00	.00	.00
3	.00	.07	.04	.00	.00	.00	.07	.11	.00	.00	.00	.00
4	.00	.07	.04	.00	.00	.00	.07	.04	.00	.00	.00	.00
5	.00	.07	.04	.00	.00	.04	.07	.04	.00	.00	.00	.00
6	.00	.07	.04	.00	.00	.04	.07	.00	.00	.04	.00	.00
7	.00	.07	.04	.00	.00	.07	.00	.04	.00	.00	.00	.00
8	.00	.07	.04	.00	.00	.07	.00	.11	.00	.00	.00	.00
9	.00	.07	.04	.00	.00	.07	.04	.07	.00	.00	.00	.00
10	.00	.07	.04	.00	.00	.04	.07	.07	.00	.00	.00	.00
11	.00	.07	.04	.00	.00	.00	.11	.07	.00	.00	.00	.00
12	.00	.07	.04	.00	.00	.00	.07	.07	.00	.00	.00	.00
13	.00	.07	.04	.00	.00	.00	.11	.07	.00	.00	.00	.00
14	.00	.07	.04	.00	.00	.00	.14	.11	.00	.00	.00	.00
15	.00	.07	.04	.00	.00	.00	.18	.07	.00	.00	.00	.00
16	.00	.07	.04	.00	.00	.04	.21	.07	.00	.00	.00	.00
17	.00	.11	.04	.00	.00	.04	.21	.04	.00	.00	.00	.00
18	.00	.11	.04	.00	.00	.07	.21	.07	.00	.00	.00	.00
19	.00	.07	.04	.00	.00	.07	.21	.07	.00	.00	.00	.00
20	.00	.07	.04	.00	.00	.07	.21	.07	.00	.00	.00	.00
21	.00	.07	.04	.00	.00	.11	.21	.07	.00	.00	.00	.00
22	.00	.07	.04	.00	.00	.14	.18	.04	.00	.00	.00	.00
23	.00	.04	.04	.00	.00	.14	.18	.04	.00	.00	.00	.00
24	.00	.07	.04	.00	.00	.11	.18	.00	.00	.00	.00	.00
25	.00	.07	.00	.00	.00	.11	.18	.00	.00	.00	.00	.00
26	.00	.07	.00	.00	.04	.11	.18	.00	.00	.00	.00	.00
27	.00	.04	.00	.00	.11	.11	.18	.00	.00	.00	.00	.00
28	.00	.04	.00	.00	.07	.07	.18	.00	.00	.00	.00	.00
29	.00	.04	.00	.00	.04	.07	.18	.00	.00	.00	.00	.00
30	.00	.04	.00	.00	---	.07	.18	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.07	---	.00	---	.00	.00	---
TOTAL	0.00	1.97	0.99	0.00	0.26	1.73	4.02	1.73	0.00	0.04	0.00	0.00
MEAN	.00	.066	.032	.00	.009	.056	.13	.056	.00	.001	.00	.00
MAX	.00	.11	.07	.00	.11	.14	.21	.21	.00	.04	.00	.00
MIN	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	3.9	2.0	.0	.5	3.4	8.0	3.4	.0	.08	.0	.0

CAL YR 1987 TOTAL 2599.92 MEAN 7.12 MAX 199 MIN .00 AC-FT 5160
WTR YR 1988 TOTAL 10.74 MEAN .029 MAX .21 MIN .00 AC-FT 21

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 mi^2, approximately, of which about 5,900 mi^2 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: Nov. 20 to Feb. 27, Mar. 7-22, ice backwater; May 30 to June 16, backwater from beaver dams. Records good except those for periods Feb. 27 to Mar. 22 and May 30 to June 16 which are poor. 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.--58 years, 133 ft^3/s, 96,360 acre-ft/yr; median of yearly mean discharges, 71 ft^3/s, 51,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/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, 5.4 ft^3/s, May 21, gage height, 1.71 ft; no flow, Dec. 13 to Feb. 26, Mar. 13-21, June 23-29, and July 20 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.39	.18	.00	.00	1.3	2.8	1.6	.80	.06	.00	.00
2	.21	.51	.16	.00	.00	.96	2.8	2.9	.70	.06	.00	.00
3	.35	.74	.14	.00	.00	.73	2.8	3.4	.68	.05	.00	.00
4	.34	2.1	.12	.00	.00	.55	2.8	2.8	.53	.03	.00	.00
5	.15	1.1	.10	.00	.00	.98	3.1	2.2	.46	.04	.00	.00
6	.14	.45	.09	.00	.00	1.2	3.1	2.0	.40	.04	.00	.00
7	.16	.35	.08	.00	.00	.60	2.8	2.2	.37	.04	.00	.00
8	.33	.48	.15	.00	.00	.40	2.6	2.5	.21	.03	.00	.00
9	.31	.49	.25	.00	.00	.20	2.4	2.8	.09	.02	.00	.00
10	.34	.64	.15	.00	.00	.15	2.2	2.5	.06	.01	.00	.00
11	.46	.67	.10	.00	.00	.10	2.0	2.2	.05	.00	.00	.00
12	.67	.73	.05	.00	.00	.05	1.7	2.2	.03	.02	.00	.00
13	.69	.71	.00	.00	.00	.00	1.4	2.1	.02	.07	.00	.00
14	.68	.75	.00	.00	.00	.00	1.2	2.1	.03	.07	.00	.00
15	.90	.88	.00	.00	.00	.00	1.1	2.1	.06	.06	.00	.00
16	1.2	.93	.00	.00	.00	.00	1.1	2.0	.17	.04	.00	.00
17	1.4	1.0	.00	.00	.00	.00	.99	1.9	.18	.03	.00	.00
18	1.5	1.0	.00	.00	.00	.00	.91	1.9	.07	.02	.00	.00
19	1.5	1.0	.00	.00	.00	.00	.99	2.0	.04	.01	.00	.00
20	1.5	.90	.00	.00	.00	.00	1.2	2.6	.03	.00	.00	.00
21	2.2	.80	.00	.00	.00	.00	1.4	4.6	.02	.00	.00	.00
22	1.0	.70	.00	.00	.00	1.5	1.5	4.5	.01	.00	.00	.00
23	.78	.60	.00	.00	.00	3.0	1.4	4.9	.00	.00	.00	.00
24	.91	.50	.00	.00	.00	3.8	1.4	4.5	.00	.00	.00	.00
25	.92	.40	.00	.00	.00	3.8	1.9	4.0	.00	.00	.00	.00
26	.90	.35	.00	.00	.00	3.2	1.9	3.3	.00	.00	.00	.00
27	.70	.30	.00	.00	.30	3.0	1.5	2.9	.00	.00	.00	.00
28	.61	.26	.00	.00	3.1	2.9	1.2	2.4	.00	.00	.00	.00
29	.60	.24	.00	.00	1.3	2.9	1.0	2.0	.00	.00	.00	.00
30	.58	.20	.00	.00	---	2.8	1.3	1.4	.02	.00	.00	.00
31	.45	---	.00	.00	---	2.8	---	.90	---	.00	.00	---
TOTAL	22.66	20.17	1.57	0.00	4.70	36.92	54.49	81.40	5.03	0.70	0.00	0.00
MEAN	.73	.67	.051	.00	.16	1.19	1.82	2.63	.17	.023	.00	.00
MAX	2.2	2.1	.25	.00	3.1	3.8	3.1	4.9	.80	.07	.00	.00
MIN	.14	.20	.00	.00	.00	.00	.91	.90	.00	.00	.00	.00
AC-FT	45	40	3.1	.0	9.3	73	108	161	10	1.4	.0	.0

CAL YR 1987 TOTAL 19168.60 MEAN 52.5 MAX 1250 MIN .00 AC-FT 38020
WTR YR 1988 TOTAL 227.64 MEAN .62 MAX 4.9 MIN .00 AC-FT 452

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970, 1972 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: August 1983 to current year.
SPECIFIC CONDUCTANCE: August 1983 to current year.

INSTRUMENTATION.--Water quality monitor since August 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 28.6°C, June 7, 11, 1988; minimum, 0.0°C several days during winter months each year.
SPECIFIC CONDUCTANCE: Maximum daily, 2,190 microsiemens, Dec. 15, 1983; minimum, 320 micromsiemens, Apr. 5, 1987.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 28.6°C, June 7, 11; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,590 microsiemens, Dec. 12; minimum, 714 microsiemens, Apr. 11.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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											
06...	1730	0.15	1140	--	12.0	10.0	--	--	--	--	--
NOV											
18...	1045	0.99	1310	7.99	1.0	1.0	14	10.9	77	360	70
MAR											
31...	1620	2.8	1530	8.29	6.0	0.5	18	17.2	119	430	82
MAY											
04...	1810	2.7	1020	8.41	10.0	12.0	24	11.5	105	250	45
JUN											
16...	1830	0.07	1220	8.17	26.0	23.5	45	6.7	79	270	47

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											
18...	46	160	48	4	15	344	200	82	0.20	1.7	854
MAR											
31...	55	190	48	4	11	464	240	120	0.20	3.4	1020
MAY											
04...	34	130	52	4	9.5	292	160	81	0.20	1.4	637
JUN											
16...	38	160	55	4	11	395	120	96	0.20	12	763

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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										
18...	782	1.16	2.28	<0.100	0.040	0.190	0.030	--	--	--
MAR										
31...	980	1.39	7.63	<0.100	0.020	0.210	0.020	--	--	--
MAY										
04...	637	0.87	4.63	<0.100	0.010	0.190	0.190	<10	3	27
JUN										
16...	725	1.04	0.14	<0.100	0.160	1.10	0.900	<10	12	39

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
MAY 04...	170	<1	<1	2	2	26	<5	<4	40	0.1
JUN 16...	230	<1	<1	2	<1	25	<5	54	360	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)
MAY 04...	2	9	3	<1	<1	280	2	<10	<3	<0.010
JUN 16...	2	8	3	<1	<1	310	3	<10	13	<0.010

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.8	11.0	12.0	6.0	3.3	4.6	.5	.1	.3	---	---	---
2	10.8	8.6	9.7	5.8	5.2	5.5	.4	.1	.2	---	---	---
3	11.9	8.3	9.8	6.4	4.9	5.6	.4	.1	.2	---	---	---
4	12.5	10.1	11.1	5.6	3.6	4.6	.5	.1	.3	---	---	---
5	10.9	9.2	10.1	3.9	3.2	3.5	.5	.1	.3	---	---	---
6	9.8	8.7	9.3	3.6	2.7	3.2	.4	.1	.2	---	---	---
7	9.5	7.4	8.6	3.8	2.9	3.2	.4	.0	.2	---	---	---
8	8.3	6.6	7.5	3.8	2.6	3.1	.4	.0	.2	---	---	---
9	6.4	4.8	5.6	3.4	2.7	3.0	.4	.0	.2	---	---	---
10	4.9	3.5	4.2	3.1	2.3	2.7	.4	.0	.2	---	---	---
11	6.2	3.0	4.4	2.5	1.5	2.0	.4	.1	.2	---	---	---
12	7.0	4.1	5.4	2.6	1.7	2.2	.2	.0	.2	---	---	---
13	7.8	5.7	6.6	2.7	2.1	2.4	---	---	---	---	---	---
14	6.8	4.7	5.8	3.2	2.1	2.6	---	---	---	---	---	---
15	5.4	4.2	4.9	3.0	2.3	2.6	---	---	---	---	---	---
16	5.8	5.0	5.4	3.1	2.3	2.7	---	---	---	---	---	---
17	5.4	4.0	4.6	2.3	1.2	1.8	---	---	---	---	---	---
18	4.4	2.9	3.7	1.3	.7	1.0	---	---	---	---	---	---
19	3.2	2.1	2.7	1.4	.8	1.0	---	---	---	---	---	---
20	2.8	2.0	2.4	.9	.6	.8	---	---	---	---	---	---
21	3.4	2.3	2.8	.7	.4	.6	---	---	---	---	---	---
22	2.7	2.2	2.6	.9	.5	.7	---	---	---	---	---	---
23	2.8	1.9	2.4	1.0	.5	.7	---	---	---	---	---	---
24	3.5	2.2	2.7	.6	.3	.5	---	---	---	---	---	---
25	3.4	2.3	2.9	.5	.2	.4	---	---	---	---	---	---
26	3.4	2.3	2.9	.6	.3	.5	---	---	---	---	---	---
27	3.4	2.1	2.8	.6	.2	.4	---	---	---	---	---	---
28	3.8	2.3	3.1	.4	.2	.3	---	---	---	---	---	---
29	4.8	2.4	3.7	.6	.1	.4	---	---	---	---	---	---
30	4.6	2.5	4.0	.5	.2	.3	---	---	---	---	---	---
31	5.2	2.9	4.0	---	---	---	---	---	---	---	---	---
MONTH	12.8	1.9	5.4	6.4	.1	2.1	---	---	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	.0	.0	.0	1.1	.0	.2	15.2	13.1	14.4
2	---	---	---	.0	.0	.0	1.3	.0	.2	12.9	9.3	11.1
3	---	---	---	.0	.0	.0	.5	.0	.1	9.5	8.5	9.0
4	---	---	---	.0	.0	.0	1.5	.0	.2	13.1	8.1	10.3
5	---	---	---	.0	.0	.0	2.0	.0	.3	11.4	9.4	10.3
6	---	---	---	.2	.0	.0	2.4	.0	.5	13.0	10.0	11.1
7	---	---	---	.0	.0	.0	2.6	.0	.5	18.3	12.2	14.9
8	---	---	---	.0	.0	.0	.6	.0	.2	16.6	13.3	15.0
9	---	---	---	.0	.0	.0	1.5	.0	.3	16.5	12.7	14.6
10	---	---	---	.0	.0	.0	4.6	.0	1.6	15.5	13.4	14.6
11	---	---	---	.0	.0	.0	6.2	.8	3.2	18.9	13.6	16.1
12	---	---	---	.0	.0	.0	7.6	1.5	4.8	18.6	15.8	16.9
13	---	---	---	.0	.0	.0	8.0	2.8	5.3	18.0	13.1	15.2
14	---	---	---	.0	.0	.0	9.1	3.7	6.1	14.8	13.6	14.2
15	---	---	---	.0	.0	.0	8.8	3.9	6.2	13.5	12.0	12.7
16	---	---	---	.0	.0	.0	12.4	5.1	8.0	16.0	10.3	13.1
17	---	---	---	.0	.0	.0	10.8	6.5	8.6	17.9	13.7	15.6
18	---	---	---	.0	.0	.0	11.6	5.5	8.3	17.7	16.3	16.9
19	---	---	---	.0	.0	.0	11.4	5.0	8.0	19.6	14.1	16.7
20	---	---	---	.0	.0	.0	10.8	5.4	7.6	19.3	15.4	17.1
21	---	---	---	.0	.0	.0	10.4	5.6	7.6	20.4	14.9	17.4
22	---	---	---	.2	.0	.0	8.7	5.9	7.1	21.7	15.9	18.7
23	---	---	---	.3	.0	.0	8.3	4.4	6.5	20.8	16.8	19.0
24	---	---	---	.0	.0	.0	9.8	5.8	7.5	20.4	17.9	19.4
25	---	---	---	.1	.0	.0	8.8	5.6	7.2	23.5	18.9	20.7
26	---	---	---	.6	.0	.1	10.6	6.6	8.1	21.2	19.1	19.9
27	.0	.0	.0	.0	.0	.0	12.1	5.6	8.6	22.4	17.4	19.8
28	.0	.0	.0	.4	.0	.1	14.0	7.3	10.3	25.9	19.8	22.5
29	.0	.0	.0	.5	.0	.1	14.2	8.8	11.5	25.9	20.7	22.9
30	---	---	---	.7	.0	.1	18.2	12.0	14.5	25.4	21.4	23.3
31	---	---	---	.9	.0	.2	---	---	---	24.5	22.0	23.5
MONTH	---	---	---	.9	.0	.0	18.2	.0	5.3	25.9	8.1	16.4

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.1	21.8	23.0	---	---	---	---	---	---	---	---	---
2	26.7	21.6	23.8	---	---	---	---	---	---	---	---	---
3	27.2	20.5	23.5	---	---	---	---	---	---	---	---	---
4	25.8	20.7	23.0	---	---	---	---	---	---	---	---	---
5	26.0	21.9	23.8	---	---	---	---	---	---	---	---	---
6	27.3	22.5	24.6	---	---	---	---	---	---	---	---	---
7	28.6	23.5	25.7	---	---	---	---	---	---	---	---	---
8	26.7	22.8	24.6	---	---	---	---	---	---	---	---	---
9	27.7	21.6	24.2	---	---	---	---	---	---	---	---	---
10	28.3	22.4	24.9	---	---	---	---	---	---	---	---	---
11	28.6	23.2	25.5	---	---	---	---	---	---	---	---	---
12	24.2	20.7	22.2	---	---	---	---	---	---	---	---	---
13	21.7	18.8	20.1	---	---	---	---	---	---	---	---	---
14	19.1	17.3	18.1	---	---	---	---	---	---	---	---	---
15	22.7	16.4	18.7	---	---	---	---	---	---	---	---	---
16	23.7	17.2	20.0	---	---	---	---	---	---	---	---	---
17	26.2	19.2	22.4	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	1160	1030	1110	1150	1090	1140	1400	1270	1360	---	---	---
2	1140	1050	1110	1160	1060	1130	1400	1270	1380	---	---	---
3	1140	1030	1110	1160	1070	1130	1410	1370	1390	---	---	---
4	1160	1020	1120	1160	1120	1130	1450	1370	1420	---	---	---
5	1160	1040	1110	1180	1150	1160	1480	1330	1440	---	---	---
6	1150	1020	1090	1190	1090	1170	1500	1470	1490	---	---	---
7	1150	1030	1120	1190	1050	1150	1530	1470	1520	---	---	---
8	1160	1020	1130	1190	1150	1180	1530	1380	1460	---	---	---
9	1170	1040	1110	1200	1070	1160	1550	1440	1520	---	---	---
10	1160	1070	1140	1210	1150	1180	1570	1320	1510	---	---	---
11	1170	1060	1140	1220	1160	1190	1560	1330	1470	---	---	---
12	1180	1070	1120	1230	1180	1200	1590	1550	1560	---	---	---
13	1190	1090	1160	1210	1100	1180	---	---	---	---	---	---
14	1190	1080	1150	1190	1100	1180	---	---	---	---	---	---
15	1190	1100	1160	1220	1060	1160	---	---	---	---	---	---
16	1180	1080	1160	1230	1100	1180	---	---	---	---	---	---
17	1180	1070	1150	1280	1110	1200	---	---	---	---	---	---
18	1170	1120	1160	1320	1220	1300	---	---	---	---	---	---
19	1160	1060	1140	1330	1220	1300	---	---	---	---	---	---
20	1160	1080	1150	1340	1260	1320	---	---	---	---	---	---
21	1170	1110	1150	1360	1290	1340	---	---	---	---	---	---
22	1160	1110	1150	1350	1280	1330	---	---	---	---	---	---
23	1150	1120	1140	1370	1220	1350	---	---	---	---	---	---
24	1150	1100	1140	1380	1310	1360	---	---	---	---	---	---
25	1170	1130	1150	1380	1220	1320	---	---	---	---	---	---
26	1140	1000	1100	1360	1210	1330	---	---	---	---	---	---
27	1130	1010	1060	1380	1320	1350	---	---	---	---	---	---
28	1160	1120	1140	1380	1340	1360	---	---	---	---	---	---
29	1170	1110	1150	1360	1320	1340	---	---	---	---	---	---
30	1160	1020	1130	1370	1330	1350	---	---	---	---	---	---
31	1170	1120	1140	---	---	---	---	---	---	---	---	---
MONTH	1190	1000	1130	1380	1050	1240	---	---	---	---	---	---

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	1080	1050	1070
2	---	---	---	---	---	---	---	---	---	1080	1030	1050
3	---	---	---	---	---	---	---	---	---	1050	1010	1030
4	---	---	---	---	---	---	---	---	---	1030	1000	1020
5	---	---	---	---	---	---	---	---	---	1010	990	1000
6	---	---	---	---	---	---	---	---	---	1020	989	1000
7	---	---	---	---	---	---	---	---	---	1030	1010	1020
8	---	---	---	---	---	---	---	---	---	1040	998	1010
9	---	---	---	---	---	---	---	---	---	1040	1010	1030
10	---	---	---	---	---	---	---	---	---	1060	1040	1040
11	---	---	---	---	---	---	925	714	830	1080	1050	1060
12	---	---	---	---	---	---	905	755	866	1080	1050	1060
13	---	---	---	---	---	---	925	835	885	1070	1050	1060
14	---	---	---	---	---	---	905	865	890	1080	1030	1050
15	---	---	---	---	---	---	886	855	878	1040	1020	1030
16	---	---	---	---	---	---	946	886	913	1060	1030	1050
17	---	---	---	---	---	---	976	946	954	1070	1050	1060
18	---	---	---	---	---	---	996	966	977	1070	1060	1070
19	---	---	---	---	---	---	996	976	988	1080	1050	1070
20	---	---	---	---	---	---	1010	977	990	1090	1070	1080
21	---	---	---	---	---	---	997	967	990	1120	1070	1100
22	---	---	---	---	---	---	997	987	995	1150	1100	1120
23	---	---	---	---	---	---	1010	987	1000	1140	1120	1130
24	---	---	---	---	---	---	1050	1010	1030	1140	1130	1140
25	---	---	---	---	---	---	1070	1020	1040	1160	1140	1150
26	---	---	---	---	---	---	1030	968	1020	1160	1140	1150
27	---	---	---	---	---	---	1030	998	1020	1160	1140	1150
28	---	---	---	---	---	---	1040	1010	1020	1180	1150	1160
29	---	---	---	---	---	---	1040	1030	1030	1180	1160	1170
30	---	---	---	---	---	---	1060	1040	1050	1180	1160	1170
31	---	---	---	---	---	---	---	---	---	1190	1170	1180
MONTH	---	---	---	---	---	---	---	---	---	1190	989	1080

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1200	1180	1190	1150	1130	1140	---	---	---	---	---	---
2	1210	1180	1190	1170	1140	1150	---	---	---	---	---	---
3	1230	1190	1200	1170	1140	1160	---	---	---	---	---	---
4	1210	1180	1190	1170	1140	1160	---	---	---	---	---	---
5	1210	1190	1200	1160	1120	1140	---	---	---	---	---	---
6	1230	1200	1210	1150	1130	1140	---	---	---	---	---	---
7	1240	1210	1230	1140	1110	1130	---	---	---	---	---	---
8	1240	1210	1230	1140	1120	1130	---	---	---	---	---	---
9	1260	1220	1240	1140	1130	1130	---	---	---	---	---	---
10	1260	1230	1250	1160	1130	1140	---	---	---	---	---	---
11	1290	1240	1260	1160	1120	1150	---	---	---	---	---	---
12	1290	1260	1280	1150	1060	1120	---	---	---	---	---	---
13	1330	1270	1300	1110	1070	1090	---	---	---	---	---	---
14	1440	1210	1290	1100	1080	1090	---	---	---	---	---	---
15	1240	1190	1210	1120	1050	1090	---	---	---	---	---	---
16	1260	1210	1230	1120	1080	1100	---	---	---	---	---	---
17	---	---	---	1130	1080	1110	---	---	---	---	---	---
18	---	---	---	1120	1060	1110	---	---	---	---	---	---
19	---	---	---	1120	1080	1110	---	---	---	---	---	---
20	---	---	---	1140	1090	1120	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	1270	1230	1250	---	---	---	---	---	---	---	---	---
24	1250	1240	1250	---	---	---	---	---	---	---	---	---
25	1270	1230	1240	---	---	---	---	---	---	---	---	---
26	1250	1230	1240	---	---	---	---	---	---	---	---	---
27	1260	1220	1240	---	---	---	---	---	---	---	---	---
28	1260	1230	1250	---	---	---	---	---	---	---	---	---
29	1280	1240	1250	---	---	---	---	---	---	---	---	---
30	1260	1110	1150	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

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 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 1987 TO SEPTEMBER 1988

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)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)
NOV 17...	1330	850	8.44	0.5	3.5	18	12.0	90	240	51	28
FEB 26...	1345	1090	8.30	8.0	4.5	5	13.8	106	320	67	38
APR 13...	1220	850	8.44	7.0	6.5	19	11.5	92	240	49	28
MAY 03...	1536	885	8.52	7.5	9.5	10	10.2	88	240	50	29
JUN 14...	1030	925	8.48	13.0	20.0	16	6.7	73	260	54	31
JUL 27...	0900	968	8.29	23.0	22.5	8	8.2	95	260	52	32
AUG 24...	1615	1010	8.19	26.0	18.5	34	9.4	100	240	45	32

DATE	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)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)
NOV 17...	100	46	3	13	250	170	26	0.20	0.34	564
FEB 26...	130	45	3	16	336	240	33	0.30	3.4	745
APR 13...	97	46	3	10	255	170	24	0.20	3.0	564
MAY 03...	97	45	3	13	261	180	25	0.30	0.55	577
JUN 14...	100	44	3	13	284	180	26	0.20	4.6	613
JUL 27...	110	47	3	9.0	292	190	31	0.20	11	641
AUG 24...	130	52	4	13	294	180	32	0.30	4.7	667

DATE	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)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS 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)
NOV 17...	540	0.77	0.130	0.030	0.220	0.120	--	--	--
FEB 26...	730	1.01	<0.100	0.010	0.160	0.130	<10	5	100
APR 13...	534	0.77	<0.100	0.020	0.140	0.050	--	--	--
MAY 03...	552	0.78	<0.100	0.010	0.110	0.050	<10	3	62
JUN 14...	581	0.83	<0.100	0.050	0.400	0.330	<10	11	25
JUL 27...	611	0.87	<0.100	<0.010	0.380	0.270	--	--	--
AUG 24...	615	0.91	<0.100	0.030	0.490	0.360	--	--	--

05114700 LAKE DARLING NEAR GRANO, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 17...	250	--	--	--	--	--	--	--	--	--
FEB 26...	300	1	1	1	1	20	<5	50	40	<0.1
APR 13...	220	--	--	--	--	--	--	--	--	--
MAY 03...	240	<1	<1	<1	1	47	<5	38	13	0.1
JUN 14...	270	<1	<1	3	1	<3	<5	44	17	0.2
JUL 27...	270	--	--	--	--	--	--	--	--	--
AUG 24...	290	--	--	--	--	--	--	--	--	--

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 26...	5	12	2	<1	<1	420	--	<10	<10	<0.010
MAY 03...	4	6	6	<1	<1	300	2	<10	<3	<0.010
JUN 14...	4	7	3	<1	<1	320	3	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 mi^2, approximately, of which about 6,200 mi^2 is probably noncontributing.

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.--Gage heights frequently affected by wind. 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.--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, 86,000 acre-ft, Oct. 13, gage height, 18.22 ft; minimum observed, 55,000 acre-ft, Sept. 30, gage height, 14.43 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	18.05	84,400	--
Oct. 31	17.78	82,100	-2,300
Nov. 30	17.52	79,900	-2,200
Dec. 31	17.42	79,100	-800
CAL YR 1987	-	-	-3,700
Jan. 31	17.42	79,100	0
Feb. 29	17.49	79,700	+600
Mar. 31	17.49	79,700	0
Apr. 30	17.25	77,600	-2,100
May 31	16.85	74,200	-3,400
June 30	16.35	70,000	-4,200
July 31	16.08	67,700	-2,300
Aug. 31	14.91	58,400	-9,300
Sept. 30	14.43	55,000	-3,400
WTR YR 1988	-	-	-29,400

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 mi^2, approximately, of which about 6,200 mi^2 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: No estimated daily discharges. Records good. 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.--52 years, 139 ft^3/s, 100,700 acre-ft/yr; median of yearly mean discharges, 60 ft^3/s, 43,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,600 ft^3/s, Apr. 17, 1976, gage height, 17.17 ft; maximum reverse flow, 25 ft^3/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, 141 ft^3/s, Aug. 9, gage height, 5.84 ft; no flow June 26,27,29, and July 16 to Aug. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	11	2.0	1.1	.81	.96	1.4	.82	.34	.54	.00	59
2	26	11	2.0	1.1	.81	.93	1.4	1.0	.42	.48	.00	60
3	26	11	1.9	1.1	.81	.93	1.4	1.0	.44	.49	.00	60
4	26	12	1.7	1.1	.81	.94	1.4	.85	.39	.49	.00	60
5	26	12	1.6	1.0	.81	.96	1.3	.73	.26	.66	.00	60
6	25	11	1.5	.98	.81	.91	1.2	.66	.15	.50	.00	61
7	25	11	1.4	.96	.81	.91	1.1	.72	.20	.34	.00	57
8	25	11	1.4	.92	.79	.96	1.1	.98	.27	.27	.00	39
9	25	11	1.4	.78	.81	.90	.99	1.0	.22	.22	73	40
10	24	11	1.4	.68	.81	.91	.78	.90	.21	.22	92	46
11	24	11	1.4	.66	.81	.96	.68	.87	.19	.22	84	33
12	23	11	1.4	.66	.76	.85	.66	.84	.16	.25	85	30
13	20	11	1.3	.66	.77	.78	.68	.81	.11	.48	85	25
14	20	11	1.2	.67	.85	.78	.74	.74	.31	.35	85	25
15	20	11	1.2	.74	.79	.79	.74	.78	.43	.27	85	25
16	17	11	1.2	.74	.81	.79	.74	.71	.26	.13	78	23
17	4.9	11	1.2	.81	.81	.78	.73	.59	.21	.07	67	4.1
18	3.6	8.2	1.2	.76	.91	.78	.66	.62	.15	.00	75	2.8
19	3.4	2.9	1.1	.74	.96	.81	.66	.66	.15	.00	87	1.7
20	3.3	2.5	1.1	.76	.93	.79	.59	.61	.15	.00	87	1.3
21	3.3	2.5	1.1	.72	.94	.81	.65	.59	.23	.00	87	1.3
22	3.3	2.5	1.1	.76	.94	.85	.66	.59	.14	.00	87	1.1
23	3.0	2.2	1.1	.74	.92	.81	.62	.59	.10	.00	87	1.0
24	2.8	2.2	1.1	.78	.90	.89	.65	.57	.20	.00	86	.99
25	2.8	2.2	1.1	.78	.90	1.0	.71	.46	.11	.00	87	.88
26	3.9	2.2	1.1	.71	.96	1.1	.67	.44	.04	.00	87	.86
27	10	2.2	1.1	.71	1.0	1.2	.76	.42	.06	.00	87	.58
28	11	2.2	1.1	.70	.97	1.4	.81	.35	.11	.00	71	.44
29	11	2.2	1.1	.71	.92	1.4	.81	.27	.07	.00	58	.44
30	11	2.1	1.1	.74	---	1.4	.81	.22	.42	.00	58	.34
31	11	---	1.1	.74	---	1.4	---	.24	---	.00	58	---
TOTAL	467.3	225.1	40.7	25.01	24.93	29.68	26.10	20.63	6.50	5.98	1836.00	720.83
MEAN	15.1	7.50	1.31	.81	.86	.96	.87	.67	.22	.19	59.2	24.0
MAX	27	12	2.0	1.1	1.0	1.4	1.4	1.0	.44	.66	92	61
MIN	2.8	2.1	1.1	.66	.76	.78	.59	.22	.04	.00	.00	.34
AC-FT	927	446	81	50	49	59	52	41	13	12	3640	1430

CAL YR 1987 TOTAL 14374.6 MEAN 39.4 MAX 864 MIN 1.1 AC-FT 28510
WTR YR 1988 TOTAL 3428.76 MEAN 9.37 MAX 92 MIN .00 AC-FT 6800

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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											
06...	1140	24	975	--	10.5	10.0	--	--	--	--	--
NOV											
19...	1700	2.9	1010	8.18	2.0	2.5	17	13.0	94	290	58
JAN											
06...	0930	1.0	1360	--	-27.5	1.5	--	--	--	--	--
FEB											
26...	1100	0.90	1400	8.20	7.5	3.0	9	21.0	156	420	82
APR											
01...	0930	2.2	1080	8.39	9.0	4.5	13	16.0	122	310	60
MAY											
03...	0845	1.0	815	8.12	4.5	10.5	22	5.6	50	250	48
JUN											
17...	0745	0.25	985	8.58	19.5	20.0	18	5.2	57	250	40
AUG											
26...	0930	87	1060	8.26	16.0	17.0	20	5.4	56	260	50

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											
19...	36	120	46	3	14	281	210	33	0.30	0.90	683
FEB											
26...	53	170	45	4	20	412	330	49	0.30	3.2	984
APR											
01...	38	130	47	3	10	300	250	34	0.20	3.2	726
MAY											
03...	32	100	45	3	12	257	190	28	0.20	3.4	586
JUN											
17...	36	120	50	3	12	280	200	34	0.30	1.7	654
AUG											
26...	33	110	46	3	20	296	190	33	0.30	19	688

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-PHOROUS 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										
19...	641	0.93	5.33	<0.100	0.020	0.150	0.010	--	--	--
FEB										
26...	956	1.34	2.39	<0.100	0.060	0.110	0.030	<10	2	100
APR										
01...	706	0.99	4.41	<0.100	0.020	0.160	0.030	--	--	--
MAY										
03...	569	0.80	1.58	<0.100	0.050	0.110	0.060	<10	4	75
JUN										
17...	613	0.89	0.44	<0.100	0.040	0.340	0.260	20	10	73
AUG										
26...	634	0.94	161	<0.100	0.030	0.510	0.410	--	--	--

05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 19...	280	--	--	--	--	--	--	--	--	--
FEB 26...	370	1	1	3	3	40	<5	70	260	<0.1
APR 01...	290	--	--	--	--	--	--	--	--	--
MAY 03...	230	<1	<1	<1	<1	6	<5	38	100	<0.1
JUN 17...	290	<1	<1	2	1	6	<5	51	43	<0.1
AUG 26...	300	--	--	--	--	--	--	--	--	--

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 26...	6	7	3	1	<1	510	--	<10	<10	<0.010
MAY 03...	4	27	5	<1	<1	290	<1	<10	11	<0.010
JUN 17...	5	10	4	<1	<1	280	4	<10	13	<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 & Wildlife Service Dam No. 8, 6.5 mi southeast of Kenmare.

DRAINAGE AREA.--687 mi^2, approximately, of which 354 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1987 to September 1988.

GAGE.--Water-stage recorder. Datum of gage is 1,377 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 1 to Dec. 14 and Feb. 27 to July 13. Records poor. Flow slightly regulated by small upstream reservoirs.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 0.15 ft^3/s, May 15, gage height, 1.03 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.03	.01	.00	.00	.02	.00	.08	.09	.02	.00	.00
2	.03	.03	.01	.00	.00	.02	.00	.08	.09	.01	.00	.00
3	.03	.03	.01	.00	.00	.01	.00	.08	.08	.01	.00	.00
4	.03	.03	.01	.00	.00	.01	.01	.08	.07	.01	.00	.00
5	.03	.03	.01	.00	.00	.02	.01	.09	.06	.01	.00	.00
6	.03	.03	.01	.00	.00	.03	.01	.09	.05	.01	.00	.00
7	.03	.03	.01	.00	.00	.03	.01	.10	.04	.01	.00	.00
8	.03	.03	.01	.00	.00	.03	.01	.11	.01	.00	.00	.00
9	.03	.03	.01	.00	.00	.03	.01	.12	.01	.00	.00	.00
10	.03	.03	.01	.00	.00	.03	.01	.11	.00	.00	.00	.00
11	.03	.03	.02	.00	.00	.02	.00	.10	.00	.00	.00	.00
12	.03	.03	.02	.00	.00	.01	.00	.10	.00	.01	.00	.00
13	.03	.03	.01	.00	.00	.00	.00	.10	.00	.01	.00	.00
14	.03	.03	.01	.00	.00	.00	.00	.12	.06	.00	.00	.00
15	.03	.03	.00	.00	.00	.00	.00	.14	.08	.00	.00	.00
16	.03	.02	.00	.00	.00	.00	.00	.12	.07	.00	.00	.00
17	.03	.02	.00	.00	.00	.00	.00	.12	.03	.00	.00	.00
18	.03	.02	.00	.00	.00	.00	.00	.12	.01	.00	.00	.00
19	.03	.02	.00	.00	.00	.00	.00	.12	.01	.00	.00	.00
20	.03	.02	.00	.00	.00	.00	.00	.13	.01	.00	.00	.00
21	.03	.02	.00	.00	.00	.00	.00	.13	.02	.00	.00	.00
22	.03	.02	.00	.00	.00	.01	.00	.13	.02	.00	.00	.00
23	.03	.02	.00	.00	.00	.02	.00	.13	.02	.00	.00	.00
24	.03	.02	.00	.00	.00	.03	.00	.13	.01	.00	.00	.00
25	.03	.02	.00	.00	.00	.03	.00	.12	.00	.00	.00	.00
26	.03	.02	.00	.00	.00	.02	.00	.12	.00	.00	.00	.00
27	.03	.02	.00	.00	.01	.01	.00	.12	.00	.00	.00	.00
28	.03	.02	.00	.00	.02	.01	.00	.12	.00	.00	.00	.00
29	.03	.02	.00	.00	.02	.00	.03	.12	.00	.00	.00	.00
30	.03	.02	.00	.00	---	.00	.08	.11	.03	.00	.00	.00
31	.03	---	.00	.00	---	.00	---	.10	---	.00	.00	---
TOTAL	0.93	0.75	0.16	0.00	0.05	0.39	0.18	3.44	0.87	0.10	0.00	0.00
MEAN	.030	.025	.005	.00	.002	.013	.006	.11	.029	.003	.00	.00
MAX	.03	.03	.02	.00	.02	.03	.08	.14	.09	.02	.00	.00
MIN	.03	.02	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00
AC-FT	1.8	1.5	.3	.0	.1	.8	.4	6.8	1.7	.2	.0	.0

WTR YR 1988 TOTAL 6.87 MEAN .019 MAX .14 MIN .00 AC-FT 14

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 mi^2, of which about 400 mi^2 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: Dec. 13 to Feb. 28, May 1-3, and May 30 to June 4. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--45 years (water years 1905-06, 1946-88), 29.4 ft^3/s, 21,300 acre-ft/yr; median of yearly mean discharges, 16 ft^3/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,260 ft^3/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, 4.2 ft^3/s, May 4, gage height, 5.24 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.5	1.3	.05	.00	.47	3.4	2.5	2.4	.20	.00	.00
2	1.2	1.5	1.3	.00	.00	.47	3.4	3.0	2.3	.25	.00	.00
3	1.0	1.5	1.3	.00	.00	.42	3.9	3.9	2.2	.27	.00	.00
4	.91	1.5	1.3	.00	.00	.34	4.1	4.1	2.1	.32	.00	.00
5	.83	1.4	1.3	.00	.00	.29	4.0	3.9	1.9	.89	.00	.00
6	.81	1.4	1.3	.00	.00	.28	3.8	3.9	1.6	1.1	.00	.00
7	.82	1.4	1.3	.00	.00	.28	3.7	3.4	1.4	1.1	.00	.00
8	.81	1.4	1.3	.00	.00	.27	3.5	3.5	1.3	.99	.00	.00
9	.76	1.4	1.3	.00	.00	.50	3.5	3.4	1.1	.89	.00	.00
10	.74	1.4	1.3	.00	.00	.98	3.4	3.0	1.0	.55	.00	.00
11	.72	1.4	1.3	.00	.00	1.3	3.3	2.8	.89	.38	.00	.00
12	.72	1.5	1.3	.00	.00	1.2	3.1	2.6	.48	.31	.00	.00
13	.72	1.5	1.2	.00	.00	1.1	3.0	2.4	.21	.24	.00	.00
14	.73	1.5	1.2	.00	.00	.96	2.9	2.3	.23	.18	.00	.00
15	.82	1.5	1.2	.00	.00	.87	2.8	2.4	.51	.18	.00	.00
16	.85	1.6	1.1	.00	.00	.82	2.6	2.2	.54	.15	.00	.00
17	.88	1.6	1.0	.00	.00	.78	2.5	2.0	.57	.11	.00	.00
18	.95	1.6	.90	.00	.00	.76	2.4	2.0	.50	.09	.00	.00
19	1.1	1.6	.80	.00	.00	.79	2.4	2.0	.41	.08	.00	.00
20	1.1	1.5	.75	.00	.00	.80	2.3	2.0	.31	.06	.00	.00
21	1.1	1.4	.65	.00	.00	.85	2.3	2.1	.25	.03	.00	.00
22	1.1	1.4	.55	.00	.00	.94	2.2	1.9	.22	.01	.00	.00
23	1.1	1.4	.50	.00	.00	1.1	2.2	2.0	.17	.00	.00	.00
24	1.2	1.3	.45	.00	.00	1.4	2.1	2.2	.15	.00	.00	.00
25	1.2	1.3	.40	.00	.00	1.9	2.0	2.5	.14	.00	.00	.00
26	1.3	1.3	.35	.00	.00	2.1	2.0	2.5	.13	.00	.00	.00
27	1.3	1.3	.30	.00	.05	2.3	1.9	2.6	.11	.00	.00	.00
28	1.4	1.3	.25	.00	1.0	2.9	1.9	2.7	.09	.00	.00	.00
29	1.4	1.3	.20	.00	.63	3.3	1.8	2.7	.06	.00	.00	.00
30	1.5	1.3	.15	.00	---	3.3	1.8	2.6	.09	.00	.00	.00
31	1.5	---	.41	.00	---	3.4	---	2.5	---	.00	.00	---
TOTAL	32.07	43.0	27.96	0.05	1.68	37.17	84.2	83.6	23.36	8.38	0.00	0.00
MEAN	1.03	1.43	.90	.002	.058	1.20	2.81	2.70	.78	.27	.00	.00
MAX	1.5	1.6	1.3	.05	1.0	3.4	4.1	4.1	2.4	1.1	.00	.00
MIN	.72	1.3	.15	.00	.00	.27	1.8	1.9	.06	.00	.00	.00
AC-FT	64	85	55	.1	3.3	74	167	166	46	17	.0	.0

CAL YR 1987 TOTAL 5860.37 MEAN 16.1 MAX 700 MIN .15 AC-FT 11620
WTR YR 1988 TOTAL 341.47 MEAN .93 MAX 4.1 MIN .00 AC-FT 677

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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											
06...	1245	0.79	1640	--	13.0	10.0	--	--	--	--	--
NOV											
19...	1820	1.4	1820	8.30	-5.0	1.5	18	15.0	106	580	110
APR											
01...	1105	3.4	1580	8.21	12.0	0.5	26	12.4	87	330	65
MAY											
03...	1115	3.9	1560	8.35	5.5	8.0	32	8.3	70	390	70
JUN											
17...	0930	1.0	1950	8.71	22.0	20.5	65	10.0	112	490	91

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											
19...	74	240	47	4	9.0	381	550	33	0.30	13	1400
APR											
01...	41	250	62	6	6.5	364	490	20	0.20	9.8	1110
MAY											
03...	53	220	54	5	7.1	385	470	25	0.30	1.7	1050
JUN											
17...	63	280	55	6	9.8	547	550	33	0.40	25	1400

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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										
19...	1260	1.90	5.37	<0.100	0.020	0.150	0.050	--	--	--
APR										
01...	1100	1.51	10.2	<0.100	0.020	0.210	0.020	--	--	--
MAY										
03...	1080	1.43	11.1	<0.100	0.030	0.340	0.120	<10	3	44
JUN										
17...	1380	1.90	3.78	<0.100	0.040	1.60	0.910	10	24	61

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										
19...	150	--	--	--	--	--	--	--	--	--
APR										
01...	90	--	--	--	--	--	--	--	--	--
MAY										
03...	120	<1	<1	4	3	35	<5	70	110	<0.1
JUN										
17...	170	<1	<1	2	<1	<3	<5	100	5	<0.1

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)
MAY										
03...	2	13	5	<1	3	410	2	<10	<3	<0.010
JUN										
17...	3	12	3	<1	<1	520	7	10	12	<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 mi^2, approximately, of which about 6,700 mi^2 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. 19 to Apr. 10. Records good except those for period of estimated daily discharges, which are poor. 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.--85 years, 163 ft^3/s, 118,100 acre-ft/yr; median of yearly mean discharges, 85 ft^3/s, 61,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s, Apr. 20, 1904, gage height, 21.9 ft at site in Minot, from rating curve extended above 8,100 ft^3/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, 82 ft^3/s, Aug. 14, gage height, 4.74 ft; no flow, May 29 to Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	13	3.4	1.0	.60	4.0	5.2	2.2	.00	.00	.00	49
2	25	14	3.4	.95	.60	2.5	5.7	4.0	.00	.00	.00	50
3	25	14	3.4	.90	.60	2.0	5.7	5.4	.00	.00	.00	50
4	25	14	3.4	.85	.60	1.8	6.4	4.9	.00	.00	.00	50
5	25	15	3.4	.85	.60	1.6	6.7	4.9	.00	.00	.00	50
6	25	15	3.4	.80	.60	1.5	6.0	5.5	.00	.00	.00	51
7	24	15	3.4	.80	.60	1.4	5.5	5.7	.00	.00	.00	50
8	24	16	3.3	.75	.60	1.8	5.0	6.7	.00	.00	.00	49
9	24	15	3.3	.70	.60	2.5	4.5	8.9	.00	.00	.00	37
10	24	15	3.2	.70	.65	3.0	4.0	9.0	.00	.00	.00	28
11	24	15	3.3	.70	.65	2.5	3.4	7.3	.00	.00	.00	35
12	23	16	3.2	.65	.70	2.2	3.4	5.7	.00	.00	4.6	33
13	23	16	3.0	.60	.70	1.9	3.2	5.1	.00	.00	71	23
14	23	16	2.9	.60	.70	1.8	3.2	4.6	.00	.00	81	17
15	21	17	2.8	.60	.70	1.7	3.0	4.2	.00	.00	82	15
16	20	19	2.7	.60	.70	1.6	2.9	4.4	.00	.00	82	16
17	21	16	2.6	.60	.70	1.6	2.7	3.7	.00	.00	77	16
18	18	14	2.5	.60	.80	1.6	2.6	3.4	.00	.00	64	12
19	11	14	2.4	.60	.90	1.7	2.5	3.7	.00	.00	60	5.8
20	6.2	10	2.2	.60	1.0	1.8	2.3	3.6	.00	.00	68	3.6
21	4.9	7.7	2.1	.60	1.1	1.9	2.3	3.2	.00	.00	74	3.1
22	4.6	5.7	2.0	.60	1.2	2.0	2.2	2.7	.00	.00	76	2.8
23	3.9	4.3	1.9	.60	1.4	2.5	2.5	2.1	.00	.00	76	2.2
24	3.7	3.7	1.8	.60	1.6	3.0	2.9	1.7	.00	.00	75	1.9
25	3.9	3.5	1.7	.60	2.0	3.5	2.7	1.3	.00	.00	76	1.6
26	4.0	3.4	1.6	.65	3.4	4.0	2.7	.76	.00	.00	76	1.1
27	3.9	3.3	1.5	.60	4.0	4.2	2.6	.52	.00	.00	80	.72
28	4.1	3.2	1.4	.60	4.5	4.4	2.2	.17	.00	.00	78	.83
29	9.2	3.3	1.3	.60	5.0	4.6	1.7	.00	.00	.00	74	.85
30	13	3.4	1.2	.60	---	4.8	1.7	.00	.00	.00	59	.78
31	13	---	1.1	.60	---	5.0	---	.00	---	.00	51	---
TOTAL	504.4	340.5	78.8	21.10	37.80	80.4	107.4	115.35	0.00	0.00	1384.60	656.28
MEAN	16.3	11.3	2.54	.68	1.30	2.59	3.58	3.72	.00	.00	44.7	21.9
MAX	25	19	3.4	1.0	5.0	5.0	6.7	9.0	.00	.00	82	51
MIN	3.7	3.2	1.1	.60	.60	1.4	1.7	.00	.00	.00	.00	.72
AC-FT	1000	675	156	42	75	159	213	229	.0	.0	2750	1300

CAL YR 1987 TOTAL 22421.47 MEAN 61.4 MAX 860 MIN .55 AC-FT 44470
WTR YR 1988 TOTAL 3326.63 MEAN 9.09 MAX 82 MIN .00 AC-FT 6600

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	0910	24	745	--	9.0	10.0	--	--	--	--	--
NOV											
17...	1035	15	1100	--	-1.5	2.0	--	--	--	--	--
JAN											
07...	1545	0.80	1700	--	-13.5	1.0	--	--	--	--	--
FEB											
26...	0920	3.3	2400	--	1.0	0.0	--	--	--	--	--
APR											
01...	0840	5.0	1100	--	6.5	2.0	--	--	--	--	--
MAY											
02...	1730	4.7	980	8.64	6.0	12.5	280	55	35	100	43
a02...	1731	4.7	980	8.64	6.0	12.5	290	57	36	110	44
AUG											
25...	1745	76	1080	7.90	24.0	20.5	280	52	36	120	47

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAY											
02...	3	8.7	280	210	3.2	0.20	2.5	637	584	8.05	0.87
a02...	3	7.7	272	220	30	0.20	3.1	623	628	7.87	0.85
AUG											
25...	3	16	310	220	36	0.30	7.6	720	704	148	0.98

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)
MAY										
02...	4	200	10	<1	41	30	1.0	1	3	350
a02...	3	130	12	<5	43	29	--	2	<1	320
AUG										
25...	14	290	10	<1	50	40	0.1	3	<1	470

a - Split sample analysis for quality assurance.

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 mi^2, approximately, of which about 6,900 mi^2 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: Nov. 20 to Mar. 6 and July 16 to Aug. 27. Records good except those for periods of estimated daily discharge, 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.--51 years, 207 ft^3/s, 152,100 acre-ft/yr; median of yearly mean discharges, 110 ft^3/s, 79,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, Apr. 19, 1976, gage height, 17.84 ft; minimum daily flows of 0.3 ft^3/s or less occurred in Aug., Sept. 1937, Oct. 1939 and Feb. 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 83 ft^3/s, Mar. 28, gage height, 4.09 ft; minimum daily discharge, 2.0 ft^3/s, July 23-25 and Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	21	18	6.0	2.5	11	49	31	5.1	3.8	18	55
2	58	23	18	5.5	2.5	10	48	35	5.1	3.9	18	54
3	54	24	18	5.0	2.5	9.5	48	34	5.0	6.8	18	52
4	52	22	17	4.5	2.5	9.0	57	30	4.4	8.3	18	46
5	51	20	17	4.0	2.5	9.5	55	27	3.7	7.6	18	40
6	49	19	17	3.8	2.4	12	54	26	3.4	7.7	18	35
7	48	18	16	3.6	2.4	13	57	24	3.2	7.3	18	34
8	45	18	16	3.5	2.4	14	54	24	3.3	6.7	18	34
9	39	18	16	3.5	2.4	16	45	25	3.3	6.1	17	35
10	44	18	16	3.4	2.4	20	48	31	3.2	5.6	16	37
11	48	19	15	3.4	2.3	19	47	32	3.2	5.4	15	37
12	48	21	14	3.3	2.3	15	47	33	3.3	5.0	14	34
13	48	21	13	3.2	2.3	14	47	32	2.9	4.5	12	36
14	48	21	12	3.2	2.3	14	44	31	3.9	4.0	10	47
15	48	21	11	3.1	2.2	14	40	28	4.4	3.6	9.0	48
16	48	21	10	3.0	2.1	12	38	27	4.7	3.4	5.0	46
17	48	21	9.0	3.0	2.1	11	42	26	4.8	3.2	4.0	45
18	49	20	9.0	2.9	2.0	9.5	48	28	5.0	3.0	3.5	44
19	50	20	9.0	2.9	4.0	9.9	41	31	4.8	2.8	3.8	42
20	49	19	9.0	2.8	8.0	9.2	39	31	4.1	2.6	2.5	38
21	47	18	9.0	2.8	10	9.8	38	27	3.9	2.4	2.3	34
22	44	19	9.0	2.7	9.0	14	37	22	3.6	2.2	2.0	29
23	36	19	9.0	2.7	8.0	16	35	19	3.4	2.0	3.1	26
24	31	19	9.0	2.6	7.2	23	32	16	2.7	2.0	38	28
25	30	19	8.0	2.6	5.0	32	29	13	2.4	2.0	43	26
26	29	20	8.0	2.5	6.5	32	28	12	2.3	10	47	23
27	28	20	8.0	2.5	10	53	30	11	2.3	13	52	19
28	26	20	8.0	2.5	12	81	29	10	2.3	15	53	16
29	25	19	8.0	2.5	13	73	29	8.0	2.3	16	53	14
30	25	19	8.0	2.5	---	61	31	6.6	3.1	17	52	10
31	24	---	7.0	2.5	---	54	---	5.7	---	17	54	---
TOTAL	1332	597	371.0	102.0	134.8	700.4	1266	736.3	109.1	199.9	655.2	1064
MEAN	43.0	19.9	12.0	3.29	4.65	22.6	42.2	23.8	3.64	6.45	21.1	35.5
MAX	63	24	18	6.0	13	81	57	35	5.1	17	54	55
MIN	24	18	7.0	2.5	2.0	9.0	28	5.7	2.3	2.0	2.0	10
AC-FT	2640	1180	736	202	267	1390	2510	1460	216	397	1300	2110

CAL YR 1987 TOTAL 43138.2 MEAN 118 MAX 1230 MIN 7.0 AC-FT 85560
WTR YR 1988 TOTAL 7267.7 MEAN 19.9 MAX 81 MIN 2.0 AC-FT 14420

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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											
09...	0835	39	1400	--	0.5	7.0	--	--	--	--	--
NOV											
16...	1730	21	1400	8.01	0.0	3.0	11	12.2	90	450	95
JAN											
05...	1500	3.9	1900	--	-17.0	0.5	--	--	--	--	--
FEB											
23...	1700	7.2	1170	7.25	-8.0	0.0	8	3.3	22	460	110
MAR											
10...	0850	20	1250	--	6.0	0.5	--	--	--	--	--
29...	1330	77	1610	8.13	2.5	0.5	57	11.9	82	450	92
MAY											
06...	1145	26	1430	8.17	17.5	11.5	23	8.1	75	400	75
JUN											
20...	1630	3.6	1620	8.30	37.5	24.5	35	11.0	132	450	96
JUL											
26...	1000	1.2	1560	7.54	25.5	21.5	19	5.4	61	430	90
AUG											
25...	1015	42	2240	8.24	19.0	17.0	25	5.0	51	450	77

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 RAIO (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)	RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
NOV											
16...	51	160	43	3	10	290	330	43	0.40	8.9	973
FEB											
23...	44	100	32	2	6.0	465	210	15	0.20	32	813
MAR											
29...	54	210	49	4	14	325	560	20	0.20	12	1150
MAY											
06...	51	190	51	4	6.0	366	380	64	0.50	6.7	1030
JUN											
20...	52	200	48	4	10	478	360	62	0.40	15	1130
JUL											
26...	51	190	48	4	6.0	500	340	54	0.30	19	1100
AUG											
25...	63	360	62	8	17	496	450	160	0.90	10	1460

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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										
16...	873	1.32	55.7	<0.100	0.080	0.190	0.160	--	--	--
FEB										
23...	799	1.11	15.8	0.120	0.570	0.080	0.010	<10	1	200
MAR										
29...	1160	1.56	240	<0.150	0.040	0.250	0.090	--	--	--
MAY										
06...	995	1.40	72.6	<0.100	0.040	0.120	0.330	<10	6	47
JUN										
20...	1090	1.54	10.9	<0.100	0.050	1.40	2.70	<10	18	35
JUL										
26...	1050	1.50	3.53	<0.100	0.020	1.70	1.50	--	--	--
AUG										
25...	1440	1.99	166	<0.100	0.060	1.20	1.20	--	--	--

05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 16...	260	--	--	--	--	--	--	--	--	--
FEB 23...	190	1	<1	2	1	40	<5	60	990	<0.1
MAR 29...	230	--	--	--	--	--	--	--	--	--
MAY 06...	270	<1	<1	1	1	22	<5	78	210	<0.1
JUN 20...	330	<1	<1	1	<1	7	<5	92	660	<0.1
JUL 26...	300	--	--	--	--	--	--	--	--	--
AUG 25...	460	--	--	--	--	--	--	--	--	--

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 23...	3	9	1	<1	<1	530	--	20	<10	<0.010
MAY 06...	3	12	5	<1	<1	440	3	<10	<3	<0.010
JUN 20...	4	8	5	<1	<1	570	2	<10	7	<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. 5 to Apr. 1. Records good except those for periods of estimated daily discharge, which are poor. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes; controlled capacity, about 850 acre-ft.

AVERAGE DISCHARGE.--51 years, 13.1 ft^3/s, 9,490 acre-ft/yr; median of yearly mean discharges, 12 ft^3/s, 8,700 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, 64 ft^3/s, Apr. 2, gage height, 4.92 ft; no flow, July 28 to Aug. 1, Aug. 7 and 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	4.7	4.7	.40	.08	2.0	50	7.1	2.7	1.1	.00	.09
2	4.2	4.1	4.8	.35	.08	1.9	61	7.8	2.4	1.0	.02	.08
3	4.2	4.1	4.7	.30	.08	1.8	55	7.8	2.2	.94	.08	.08
4	3.7	4.1	4.6	.25	.08	1.7	42	9.5	2.1	.77	.10	.09
5	3.5	3.9	4.5	.20	.08	3.0	26	7.9	1.9	1.0	.09	.08
6	3.3	3.8	4.4	.18	.08	5.0	14	7.4	1.7	1.1	.05	.09
7	3.4	4.0	4.3	.16	.08	6.0	12	7.4	1.3	.99	.00	.06
8	4.3	4.0	4.7	.15	.08	6.5	9.6	7.2	1.3	1.1	.00	.07
9	4.4	4.0	4.6	.14	.08	5.5	8.6	7.3	1.0	.84	.01	.06
10	4.1	4.1	4.5	.12	.08	5.0	8.5	6.6	1.0	.70	.02	.09
11	4.2	4.2	4.4	.12	.08	4.5	8.2	6.9	.83	.73	.02	.26
12	4.1	4.2	4.0	.12	.08	4.2	9.0	6.9	.71	.74	.03	.35
13	4.0	4.3	3.8	.12	.08	4.0	7.3	6.8	.68	.82	.11	.26
14	3.9	4.4	3.8	.12	.08	3.5	7.1	6.5	.99	2.8	.34	.19
15	4.1	5.0	3.6	.12	.08	3.0	6.9	6.5	1.2	.61	.35	.20
16	3.8	5.1	3.6	.10	.08	2.8	7.1	6.1	1.3	.27	.29	.17
17	3.8	4.8	3.4	.10	.08	2.6	7.3	5.9	1.0	.14	.28	.14
18	4.1	4.5	3.2	.10	.10	2.4	7.2	5.9	1.2	.18	.35	.32
19	3.5	4.3	3.0	.10	.12	2.2	7.2	6.6	1.5	.22	.34	1.0
20	3.9	4.4	2.8	.10	.14	2.0	7.2	6.4	.75	.20	.28	.66
21	3.8	4.5	2.6	.10	.16	2.5	7.3	6.5	.85	.34	.25	.46
22	4.0	4.9	2.2	.10	.18	3.0	6.7	6.1	.81	.28	.16	.33
23	4.2	5.1	2.0	.10	.20	3.5	7.0	5.7	.96	.17	.10	.27
24	5.0	4.8	1.8	.10	.25	4.0	6.7	5.3	.65	.09	.05	.23
25	5.2	5.0	1.4	.10	.50	4.5	6.4	5.0	.61	.07	.03	.24
26	4.9	4.8	1.5	.09	1.0	5.0	6.5	4.9	.53	.03	.02	.25
27	4.5	4.8	1.7	.08	1.5	6.0	6.4	4.8	.30	.01	.04	.27
28	4.1	4.9	1.3	.08	2.0	7.5	6.2	4.6	.22	.00	.06	.49
29	3.9	4.9	1.0	.08	2.5	9.0	6.1	4.9	.35	.00	.08	.51
30	3.8	4.7	.80	.08	---	15	7.0	3.6	.64	.00	.09	.43
31	4.0	---	.60	.08	---	25	---	3.1	---	.00	.05	---
TOTAL	126.1	134.4	98.30	4.34	10.01	154.6	427.5	195.0	33.68	17.24	3.70	7.82
MEAN	4.07	4.48	3.17	.14	.35	4.99	14.2	6.29	1.12	.56	.12	.26
MAX	5.2	5.1	4.8	.40	2.5	25	61	9.5	2.7	2.8	.35	1.0
MIN	3.3	3.8	.60	.08	.08	1.7	6.1	3.1	.22	.00	.00	.06
AC-FT	250	267	195	8.6	20	307	848	387	67	34	7.3	16

CAL YR 1987 TOTAL 6034.85 MEAN 16.5 MAX 220 MIN .20 AC-FT 11970
WTR YR 1988 TOTAL 1212.69 MEAN 3.31 MAX 61 MIN .00 AC-FT 2410

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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											
05...	1720	3.5	650	--	15.0	11.0	--	--	--	--	--
NOV											
16...	1415	5.0	700	7.97	5.0	3.5	14	11.4	85	280	68
JAN											
05...	1130	0.20	980	--	-20.5	0.5	--	--	--	--	--
FEB											
23...	1215	0.20	820	7.32	-8.5	0.5	14	4.3	29	360	88
MAR											
29...	1030	8.7	506	7.64	1.0	0.0	--	10.2	69	--	--
MAY											
09...	1330	7.5	830	8.10	19.5	12.0	35	10.2	95	280	65
JUN											
13...	1620	0.67	720	8.36	27.5	25.5	40	8.6	104	280	60
JUL											
25...	1615	0.05	570	8.22	37.0	27.5	23	11.0	138	240	43
AUG											
25...	0815	0.03	543	7.68	12.0	13.0	22	5.8	54	210	33

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											
16...	27	52	28	1	4.3	269	55	13	0.20	15	435
FEB											
23...	35	54	24	1	6.8	393	85	11	0.20	30	551
MAY											
09...	28	82	38	2	6.7	347	100	15	0.20	9.4	523
JUN											
13...	31	66	34	2	4.6	368	40	11	0.20	20	475
JUL											
25...	31	40	27	1	3.7	295	33	7.8	0.20	15	364
AUG											
25...	32	33	25	1	2.8	268	27	6.0	0.20	6.9	322

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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										
16...	396	0.59	5.93	<0.100	0.020	0.080	0.010	--	--	--
FEB										
23...	548	0.75	0.30	<0.100	0.200	0.070	0.030	<10	1	200
MAY										
09...	515	0.71	10.6	<0.100	0.030	0.260	0.040	<10	2	150
JUN										
13...	455	0.65	0.86	<0.100	0.040	0.400	0.300	<10	7	140
JUL										
25...	351	0.50	0.05	<0.100	0.010	0.150	0.070	--	--	--
AUG										
25...	302	0.44	0.03	<0.100	0.030	0.060	0.020	--	--	--

05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 16...	130	--	--	--	--	--	--	--	--	--
FEB 23...	140	1	<1	2	<1	40	<5	30	1300	<0.1
MAY 09...	140	<1	<1	2	<1	40	<5	21	140	<0.1
JUN 13...	150	<1	<1	2	<1	13	<5	32	70	<0.1
JUL 25...	100	--	--	--	--	--	--	--	--	--
AUG 25...	90	--	--	--	--	--	--	--	--	--

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 23...	1	4	1	<1	<1	230	--	10	<10	<0.010
MAY 09...	1	7	<1	<1	1	180	2	<10	9	<0.010
JUN 13...	1	7	4	<1	<1	170	3	<10	5	<0.010

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND

LOCATION.--Lat 48°30'20", long 100°26'04", in SE¼NW¼SE¼ 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: Oct. 15-21, 26-30, and Nov. 8 to Apr. 5. Records good except those for periods of estimated daily discharges, which are fair. 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 small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--51 years, 226 ft^3/s, 163,700 acre-ft/yr; median of yearly mean discharges, 130 ft^3/s, 94,200 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, 180 ft^3/s, Apr. 5, gage height, 4.38 ft, backwater from ice; minimum daily discharge, 3.0 ft^3/s, Feb. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	33	20	5.8	4.0	17	100	54	33	6.6	3.6	11
2	80	31	19	5.6	4.0	14	120	53	30	6.4	3.7	20
3	79	29	18	5.4	3.9	16	140	50	28	5.9	3.5	27
4	76	27	17	5.2	3.8	18	160	49	27	5.7	3.4	31
5	71	24	16	5.0	3.7	20	155	48	25	5.5	3.3	35
6	66	24	15	4.9	3.7	22	124	48	23	6.1	3.3	38
7	64	23	14	4.8	3.7	24	106	48	22	6.4	3.5	42
8	63	23	13	4.7	3.6	25	98	48	20	5.7	3.9	44
9	57	24	12	4.6	3.5	30	91	48	18	4.9	4.8	45
10	55	25	11	4.5	3.3	36	88	48	17	4.2	5.2	45
11	51	25	10	4.3	3.2	36	88	49	16	4.0	5.6	48
12	52	25	9.5	4.1	3.2	32	86	48	14	4.5	6.5	44
13	52	26	9.0	4.0	3.2	31	82	46	13	6.4	6.1	42
14	48	27	8.8	3.9	3.2	31	79	46	13	6.2	6.8	40
15	50	28	8.6	3.8	3.2	32	78	47	13	5.9	16	39
16	52	29	8.4	3.8	3.2	30	78	47	12	5.6	14	37
17	54	30	8.2	3.9	3.2	28	76	47	12	5.2	15	36
18	54	30	8.0	4.0	3.0	26	72	48	11	4.9	15	35
19	54	31	7.9	3.9	4.0	25	72	49	9.9	4.5	15	37
20	54	31	7.8	3.9	5.0	25	70	49	8.6	4.2	15	36
21	54	30	7.7	3.9	5.5	26	68	48	8.0	4.2	15	37
22	54	29	7.6	4.0	6.5	27	68	47	7.5	4.2	13	40
23	54	28	7.5	4.0	7.5	28	66	45	7.1	4.2	11	41
24	54	27	7.4	4.0	8.5	30	65	44	7.2	4.0	9.7	41
25	54	26	7.2	4.0	10	38	62	44	6.6	4.0	8.4	42
26	52	25	7.0	4.0	12	40	61	45	6.2	3.9	7.0	41
27	50	24	6.8	4.0	14	45	60	47	5.9	3.9	6.7	39
28	48	23	6.6	4.1	16	50	58	42	5.8	3.9	5.6	38
29	45	22	6.4	4.2	18	60	56	40	5.2	3.8	5.4	37
30	42	21	6.2	4.2	---	65	56	37	5.7	3.8	5.4	35
31	39	---	6.0	4.1	---	80	---	34	---	3.7	5.4	---
TOTAL	1766	800	317.6	134.6	169.6	1007	2583	1443	430.7	152.4	245.8	1123
MEAN	57.0	26.7	10.2	4.34	5.85	32.5	86.1	46.5	14.4	4.92	7.93	37.4
MAX	88	33	20	5.8	18	80	160	54	33	6.6	16	48
MIN	39	21	6.0	3.8	3.0	14	56	34	5.2	3.7	3.3	11
AC-FT	3500	1590	630	267	336	2000	5120	2860	854	302	488	2230

CAL YR 1987 TOTAL 52202.9 MEAN 143 MAX 1200 MIN 6.0 AC-FT 103500
WTR YR 1988 TOTAL 10172.7 MEAN 27.8 MAX 160 MIN 3.0 AC-FT 20180

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT										
08...	1530	64	1250	8.25	10.5	10.0	9.8	86	--	--
NOV										
19...	1330	32	1180	--	-0.5	0.5	--	--	--	--
JAN										
07...	1245	4.8	1550	--	-15.5	0.0	--	--	--	--
FEB										
24...	1200	8.5	2050	--	-9.0	0.0	--	--	--	--
MAR										
08...	1730	25	1280	--	1.5	0.0	--	--	--	--
APR										
01...	0840	5.0	1100	--	6.5	2.0	--	--	--	--
11...	1845	88	1030	--	--	--	--	--	--	--
MAY										
09...	1715	49	1090	8.45	25.0	17.5	--	--	330	68
JUN										
15...	1530	13	1310	8.40	20.0	23.0	--	--	--	--
JUL										
28...	1315	3.9	1260	8.13	34.5	27.5	--	--	--	--
AUG										
23...	1600	12	1300	8.50	24.0	22.5	--	--	300	50

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)
MAY									
09...	38	120	44	3	9.6	320	240	29	0.40
AUG									
23...	43	190	57	5	11	400	240	61	0.40

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)	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)
MAY									
09...	2.4	734	715	1.0	97.1	4	250	10	<1
AUG									
23...	1.9	882	895	1.20	27.9	20	300	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									
08...	--	--	--	--	--	--	27	4.7	97
MAY									
09...	50	80	0.7	2	2	360	10	1.3	82
JUL									
28...	--	--	--	--	--	--	22	0.24	99
AUG									
23...	70	30	0.2	1	<1	380	3	0.09	100

05123400 WILLOW CREEK NEAR WILLOW CITY, ND

LOCATION.--Lat 48°35'20", long 100°26'30", in NE¼NW¼ 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, nonrecording gage at site 50 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 18-21 and Apr. 13 to June 8. Records poor.

AVERAGE DISCHARGE.--32 years, 41.7 ft^3/s, 30,210 acre-ft/yr; median of yearly mean discharges, 21 ft^3/s, 15,200 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)
Apr. 6	0130	*20	*7.60				

No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.29	1.3	.00	.00	.00	.00	1.9	.12	.00	.00	.00	.00
2	.55	1.2	.00	.00	.00	.00	1.9	.16	.00	.00	.00	.00
3	.78	.85	.00	.00	.00	.00	1.9	.17	.00	.00	.00	.00
4	.93	.42	.00	.00	.00	.00	1.9	.17	.00	.00	.00	.00
5	1.5	.00	.00	.00	.00	.00	7.6	.14	.00	.00	.00	.00
6	1.5	.00	.00	.00	.00	.00	8.0	.18	.00	.00	.00	.00
7	1.5	.00	.00	.00	.00	.00	1.8	.20	.00	.00	.00	.00
8	1.8	.00	.00	.00	.00	.00	1.4	.22	.00	.00	.00	.00
9	1.9	.00	.00	.00	.00	.00	.15	.24	.00	.00	.00	.00
10	1.5	.00	.00	.00	.00	.00	.43	.24	.00	.00	.00	.00
11	1.1	.00	.00	.00	.00	.00	.42	.22	.00	.00	.00	.00
12	.77	.00	.00	.00	.00	.00	1.5	.20	.00	.00	.00	.00
13	.60	.00	.00	.00	.00	.00	1.9	.18	.00	.00	.00	.00
14	.08	.00	.00	.00	.00	.00	1.9	.16	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	1.8	.14	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	1.8	.14	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	1.7	.12	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	1.6	.14	.00	.00	.00	.00
19	.00	.20	.00	.00	.00	.00	1.5	.12	.00	.00	.00	.00
20	.07	.30	.00	.00	.00	.00	1.4	.10	.00	.00	.00	.00
21	.07	.10	.00	.00	.00	.00	1.3	.08	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	1.2	.07	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	1.1	.06	.00	.00	.00	.00
24	.18	.00	.00	.00	.00	.00	1.0	.05	.00	.00	.00	.00
25	1.8	.00	.00	.00	.00	.00	.80	.04	.00	.00	.00	.00
26	3.9	.00	.00	.00	.00	.00	.60	.03	.00	.00	.00	.00
27	4.1	.00	.00	.00	.00	.00	.40	.02	.00	.00	.00	.00
28	4.0	.00	.00	.00	.00	.0	.20	.01	.00	.00	.00	.00
29	3.5	.00	.00	.00	.00	.59	.12	.00	.00	.00	.00	.00
30	2.3	.00	.00	.00	---	.95	.11	.00	.00	.00	.00	.00
31	1.6	---	.00	.00	---	1.4	---	.00	---	.00	.00	---
TOTAL	36.32	4.37	0.00	0.00	0.00	2.94	49.33	3.72	0.00	0.00	0.00	0.00
MEAN	1.17	.15	.00	.00	.00	.095	1.64	.12	.00	.00	.00	.00
MAX	4.1	1.3	.00	.00	.00	1.4	8.0	.24	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00
AC-FT	72	8.7	.0	.0	.0	5.8	98	7.4	.0	.0	.0	.0

CAL YR 1987 TOTAL 12974.48 MEAN 35.5 MAX 700 MIN .00 AC-FT 25730
WTR YR 1988 TOTAL 96.68 MEAN .26 MAX 8.0 MIN .00 AC-FT 192

05123400 WILLOW CREEK NEAR WILLOW CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-62, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 08...	1215	1.7	920	--	9.0	9.5	--	--	--	--	--
NOV 19...	1100	0.30	1100	--	-1.0	2.5	--	--	--	--	--
APR 12...	1110	1.9	1550	8.18	11.5	7.5	51	11.1	92	390	61
MAY 05...	1740	0.18	1590	8.13	19.5	11.5	58	9.9	89	390	66

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)
APR 12...	58	190	51	4	10	235	370	150	0.20	6.3	1020
MAY 05...	55	200	51	4	16	312	420	110	0.20	7.2	1080

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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)	BORON, DIS-SOLVED (UG/L AS B) (01020)
APR 12...	987	1.39	5.21	<0.100	0.030	0.240	0.100	--	--	--	170
MAY 05...	1060	1.47	0.52	<0.100	0.050	0.110	0.240	<10	4	61	270

DATE	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)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)
APR 12...	--	--	--	--	--	--	--	--	--	--	--
MAY 05...	<1	<1	5	1	27	<5	110	28	<0.1	1	10

DATE	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)	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 12...	--	--	--	--	--	--	--	--	6	0.03	100
MAY 05...	6	<1	<1	350	4	<10	5	<0.010	94	0.05	53

05123500 STONE CREEK NEAR KRAMER, ND

LOCATION.--Lat 48°40'42", long 100°42'40", in NW¼NW¼NW¼ 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.--No flow during entire period. Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 620 ft^3/s, Mar. 24, 1986, gage height, 6.2 ft, from flood mark; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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	.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					.00	.00	.00	.00	.00	.00	.00	.00
MAX					.00	.00	.00	.00	.00	.00	.00	.00
MIN					.00	.00	.00	.00	.00	.00	.00	.00
AC-FT					.0	.0	.0	.0	.0	.0	.0	.0

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 mi^2, of which about 605 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1980, March 1985 to September 1985 (seasonal records only since 1985).

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

REMARKS.--Estimated daily discharges: May 1-25. Records fair.

AVERAGE DISCHARGE.--23 years (water years 1958-80), 20.4 ft^3/s, 14,780 acre-ft/yr; median of yearly mean discharges, 0.90 ft^3/s, 650 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,760 ft^3/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 ft^3/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 0.41 ft^3/s, Apr. 1, gage height, 6.73 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	.00	.41	.03	.00	.00	.00	.00
2					.00	.00	.39	.02	.00	.00	.00	.00
3					.00	.00	.33	.02	.00	.00	.00	.00
4					.00	.00	.31	.01	.00	.00	.00	.00
5					.00	.00	.37	.00	.00	.00	.00	.00
6					.00	.00	.36	.01	.00	.00	.00	.00
7					.00	.00	.27	.02	.00	.00	.00	.00
8					.00	.00	.26	.04	.00	.00	.00	.00
9					.00	.00	.25	.04	.00	.00	.00	.00
10					.00	.00	.21	.05	.00	.00	.00	.00
					.00	.00	.15	.06	.00	.00	.00	.00
12					.00	.00	.13	.06	.00	.00	.00	.00
13					.00	.00	.12	.06	.00	.00	.00	.00
14					.00	.00	.11	.06	.00	.00	.00	.00
15					.00	.00	.10	.06	.00	.00	.00	.00
16					.00	.00	.09	.05	.00	.00	.00	.00
17					.00	.00	.09	.04	.00	.00	.00	.00
18					.00	.00	.08	.04	.00	.00	.00	.00
19					.00	.00	.08	.04	.00	.00	.00	.00
20					.00	.00	.06	.03	.00	.00	.00	.00
21					.00	.00	.06	.03	.00	.00	.00	.00
22					.00	.00	.06	.02	.00	.00	.00	.00
23					.00	.00	.05	.01	.00	.00	.00	.00
24					.00	.00	.05	.00	.00	.00	.00	.00
25					.00	.00	.04	.00	.00	.00	.00	.00
26					.00	.00	.04	.00	.00	.00	.00	.00
27					.00	.00	.03	.00	.00	.00	.00	.00
28					.00	.00	.03	.00	.00	.00	.00	.00
29					.00	.01	.02	.00	.00	.00	.00	.00
30					---	.16	.03	.00	.00	.00	.00	.00
31					---	.27	---	.00	---	.00	.00	---
TOTAL					0.00	0.44	4.58	0.80	0.00	0.00	0.00	0.00
MEAN					.00	.014	.15	.026	.00	.00	.00	.00
MAX					.00	.27	.41	.06	.00	.00	.00	.00
MIN					.00	.00	.02	.00	.00	.00	.00	.00
AC-FT					.0	.9	9.1	1.6	.0	.0	.0	.0

05123510 DEEP RIVER NEAR UPHAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-80, 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR 30...	1130	0.17	695	7.88	1.0	1.5	280	44	42	36	21

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 30...	1	16	160	180	34	0.10	3.7	471	455	0.22	0.64

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)
MAR 30...	2	40	40	<1	41	270	0	0	1	190

05123750 CUT BANK CREEK AT UPHAM, ND

LOCATION.--Lat 48° 4'29", long 100°44'39", in SE¼SE¼SW¼ 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.--Estimated daily discharges: Mar. 26 to Apr. 4. Records fair except those for period of estimated daily discharges, which are poor.

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.--Maximum discharge observed, 3.7 ft^3/s, Apr. 12, gage height, 2.49 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	.00	.90	1.4	1.4	.00	.00	.00
2					.00	.00	1.0	1.6	1.3	.00	.00	.00
3					.00	.00	1.1	1.8	1.2	.00	.00	.00
4					.00	.00	1.2	2.0	1.1	.00	.00	.00
5					.00	.00	1.4	2.1	.96	.00	.00	.00
6					.00	.00	1.6	2.1	.82	.00	.00	.00
7					.00	.00	1.9	2.2	.71	.00	.00	.00
8					.00	.00	2.2	2.4	.60	.00	.00	.00
9					.00	.00	2.5	2.5	.48	.00	.00	.00
10					.00	.00	3.1	2.6	.37	.00	.00	.00
11					.00	.00	3.4	2.7	.24	.00	.00	.00
12					.00	.00	3.7	2.8	.09	.00	.00	.00
13					.00	.00	3.6	2.7	.00	.00	.00	.00
14					.00	.00	3.6	2.8	.03	.00	.00	.00
15					.00	.00	3.3	2.7	.09	.00	.00	.00
16					.00	.00	2.9	2.7	.01	.00	.00	.00
17					.00	.00	2.5	2.8	.00	.00	.00	.00
18					.00	.00	2.4	2.7	.00	.00	.00	.00
19					.00	.00	2.2	2.6	.00	.00	.00	.00
20					.00	.00	2.0	2.6	.00	.00	.00	.00
21					.00	.00	1.8	2.6	.00	.00	.00	.00
22					.00	.00	1.7	2.5	.00	.00	.00	.00
23					.00	.00	1.6	2.4	.00	.00	.00	.00
24					.00	.00	1.5	2.3	.00	.00	.00	.00
25					.00	.00	1.4	2.2	.00	.00	.00	.00
26					.00	.00	1.3	2.0	.00	.00	.00	.00
27					.00	.00	1.2	1.8	.00	.00	.00	.00
28					.00	.10	1.2	1.7	.00	.00	.00	.00
29					.00	.30	1.2	1.6	.00	.00	.00	.00
30					---	.65	1.2	1.5	.00	.00	.00	.00
31					---	.80	---	1.4	---	.00	.00	---
TOTAL					0.00	1.85	60.60	69.8	9.40	0.00	0.00	0.00
MEAN					.00	.060	2.02	2.25	.31	.00	.00	.00
MAX					.00	.80	3.7	2.8	1.4	.00	.00	.00
MIN					.00	.00	.90	1.4	.00	.00	.00	.00
AC-FT					.0	3.7	120	138	19	.0	.0	.0

05123750 CUT BANK CREEK AT UPHAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-80, 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
08...	1015	1.2	1170	--	7.0	7.0	--	--	--	--	--
MAR											
30...	1415	0.64	1160	7.42	4.0	0.0	350	41	61	100	35
APR											
12...	1830	3.6	780	--	14.5	7.5	--	--	--	--	--
MAY											
05...	1215	2.1	1030	--	11.0	7.5	--	--	--	--	--
JUN											
15...	1015	0.09	1330	--	16.0	14.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	2	33	150	400	55	0.10	5.3	824	786	1.42	1.12

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)
MAR										
30...	2	120	60	<1	76	410	0.1	2	1	220

05123760 DEEP RIVER BELOW CUT BANK CREEK NEAR UPHAM, ND

LOCATION.--Lat 48°36'14", long 100°47'41", in SW¼SW¼SW¼ sec.7, T.159 N., R.78 W., McHenry County, Hydrologic Unit 09010005, at bridge 0.5 mi below Cut Bank Creek, and about 3.5 mi northwest of Upham at bridge on county highway.

DRAINAGE AREA.--1,722 mi^2, of which about 1,070 mi^2 is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to September 1980, March 1986 to current year.

REMARKS.--Discharge computed from records at stations 05123510 Deep River near Upham and 05123750 Cut Bank Creek at Upham.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAY 05...	1400	2.1	960	8.38	12.5	10.5	51	10.8	95	330	50

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)
MAY 05...	50	73	31	2	22	287	180	39	0.20	2.7	623

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-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS 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)	BORON, DIS-SOLVED (UG/L AS B) (01020)
MAY 05...	590	0.85	3.53	<0.100	0.010	0.230	0.110	<10	3	84	60

DATE	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)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)
MAY 05...	<1	<1	2	<1	17	<5	46	5	<0.1	1	14

DATE	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)	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 05...	4	<1	<1	210	3	<10	9	<0.010	12	0.07	85

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 09010002, 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. 4 to May 10. Records poor.

AVERAGE DISCHARGE.--24 years (1958-1981, 1985), 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, 3.6 ft^3/s, Apr. 9, gage height, 6.83 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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	.07	.00	.00	.00	.00
4					.00	.00	1.5	.07	.00	.00	.00	.00
5					.00	.00	2.1	.03	.00	.00	.00	.00
6					.00	.00	1.1	.01	.00	.00	.00	.00
7					.00	.00	2.2	.04	.00	.00	.00	.00
8					.00	.00	3.2	.07	.00	.00	.00	.00
9					.00	.00	3.3	.03	.00	.00	.00	.00
10					.00	.00	2.5	.00	.00	.00	.00	.00
11					.00	.00	2.5	.00	.00	.00	.00	.00
12					.00	.00	1.5	.00	.00	.00	.00	.00
13					.00	.00	.85	.00	.00	.00	.00	.00
14					.00	.00	.60	.00	.00	.00	.00	.00
15					.00	.00	.64	.00	.00	.00	.00	.00
16					.00	.00	.57	.00	.00	.00	.00	.00
17					.00	.00	.61	.00	.00	.00	.00	.00
18					.00	.00	.68	.00	.00	.00	.00	.00
19					.00	.00	.68	.00	.00	.00	.00	.00
20					.00	.00	.57	.00	.00	.00	.00	.00
21					.00	.00	.46	.00	.00	.00	.00	.00
22					.00	.00	.33	.00	.00	.00	.00	.00
23					.00	.00	.21	.00	.00	.00	.00	.00
24					.00	.00	.06	.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	.00
30					---	.00	.00	.00	.00	.00	.00	.00
31					---	.00	---	.00	---	.00	.00	---
TOTAL					0.00	0.00	26.16	0.32	0.00	0.00	0.00	0.00
MEAN					.00	.00	.87	.010	.00	.00	.00	.00
MAX					.00	.00	3.3	.07	.00	.00	.00	.00
MIN					.00	.00	.00	.00	.00	.00	.00	.00
AC-FT					.0	.0	52	.6	.0	.0	.0	.0

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 SW1/4SE1/4 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 mi^2, approximately, of which about 10,300 mi^2 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: Mar. 12 and June 3-16. 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.--57 years (water years 1931-88), 257 ft^3/s, 186,200 acre-ft/yr; median of yearly mean discharges, 140 ft^3/s, 101,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft^3/s, Apr. 26, 1976, gage height, 19.16 ft; maximum daily reverse flow, 35 ft^3/s, Apr. 8, 1943, caused by backwater from downstream tributary inflow; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 160 ft^3/s, Nov. 30, gage height, 6.74 ft; no flow Apr. 17-29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	56	9.3	27	28	17	4.5	.17	39	25	24	22
2	75	55	4.2	27	28	4.2	5.2	.58	35	25	24	21
3	74	55	3.1	30	28	3.6	6.3	.70	33	25	23	21
4	73	54	2.8	30	28	3.6	6.2	.65	32	24	23	22
5	66	63	1.5	30	27	3.5	5.3	.24	31	25	22	23
6	72	98	.46	30	27	3.3	4.7	.44	30	23	20	22
7	73	97	2.3	30	27	3.1	3.9	.83	29	24	19	22
8	73	98	7.0	30	27	2.9	4.3	.49	29	23	20	23
9	71	98	4.1	30	27	2.8	5.1	.54	29	23	21	26
10	73	82	2.7	30	27	2.7	2.9	.63	29	22	21	27
11	74	42	2.6	31	27	2.2	2.8	.99	29	23	21	24
12	74	41	2.9	31	26	2.5	1.8	1.8	29	24	23	25
13	72	40	3.1	31	26	2.9	.92	2.6	29	22	23	25
14	72	41	7.5	31	25	2.8	.54	2.8	29	18	23	25
15	73	40	22	31	26	2.8	.27	2.9	28	21	23	25
16	73	40	24	33	25	2.9	.08	3.1	27	21	23	25
17	72	40	24	33	25	2.9	.00	6.7	21	21	23	24
18	72	77	24	32	25	3.0	.00	8.4	22	21	23	23
19	65	149	23	31	25	3.1	.00	8.4	30	21	23	23
20	38	151	23	31	25	3.9	.00	8.6	32	21	23	27
21	38	151	24	30	25	4.4	.00	8.4	29	20	23	27
22	37	152	25	30	24	4.7	.00	8.6	28	21	22	24
23	36	152	25	30	24	5.5	.00	9.0	30	20	21	23
24	37	152	25	30	24	7.0	.00	9.6	36	20	21	23
25	37	152	25	30	24	5.8	.00	9.4	41	20	22	23
26	36	152	26	30	24	5.1	.00	9.6	27	20	23	23
27	36	152	26	30	24	4.7	.00	9.7	25	20	22	22
28	36	152	26	29	24	4.8	.00	9.1	25	20	22	23
29	36	154	26	29	24	4.4	.00	8.6	25	23	23	23
30	41	101	26	29	---	4.5	.03	8.0	26	24	23	23
31	54	---	27	28	---	4.5	---	9.4	---	23	23	---
TOTAL	1832	2887	474.56	934	746	131.1	54.84	150.96	884	683	690	709
MEAN	59.1	96.2	15.3	30.1	25.7	4.23	1.83	4.87	29.5	22.0	22.3	23.6
MAX	75	154	27	33	28	17	6.3	9.7	41	25	24	27
MIN	36	40	.46	27	24	2.2	.00	.17	21	18	19	21
AC-FT	3630	5730	941	1850	1480	260	109	299	1750	1350	1370	1410

CAL YR 1987 TOTAL 92197.56 MEAN 253 MAX 2260 MIN .46 AC-FT 182900
WTR YR 1988 TOTAL 10176.46 MEAN 27.8 MAX 154 MIN .00 AC-FT 20190

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(International gaging station)
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954-64, 1966 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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												
07...	1030	73	950	8.21	5.5	9.5	--	8.0	69	--	--	--
NOV												
18...	1700	113	910	8.72	4.5	4.0	6.3	15.4	117	<5	50	300
JAN												
06...	1735	32	1410	--	-14.0	0.5	--	--	--	--	--	--
FEB												
25...	1115	23	2600	7.61	-1.0	2.0	1.7	13.6	98	25	K420	830
MAR												
31...	1130	4.6	1920	7.97	3.5	3.0	--	13.5	98	--	--	--
MAY												
04...	1100	0.80	1460	8.34	4.5	8.0	6.1	10.5	87	K100	460	450
JUN												
16...	1245	27	1140	8.72	22.5	18.5	--	8.0	84	--	--	--
JUL												
28...	1630	20	1070	8.56	34.5	26.5	34	4.4	54	<10	440	250
AUG												
24...	1000	20	1210	8.13	20.5	17.0	--	3.2	33	--	--	--

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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												
07...	--	--	--	--	--	--	306	374	0	--	--	--
NOV												
18...	58	38	98	40	3	12	322	315	38	170	23	0.20
FEB												
25...	170	97	310	44	5	28	902	1100	0	520	120	0.50
MAR												
31...	--	--	--	--	--	--	984	1200	0	--	--	--
MAY												
04...	79	62	170	44	4	10	424	478	19	350	54	0.30
JUN												
16...	--	--	--	--	--	--	362	373	34	--	--	--
JUL												
28...	28	43	140	54	4	9.0	336	264	72	180	43	0.30

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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)
NOV												
18...	0.11	613	589	0.83	187	<0.010	<0.100	0.030	0.030	0.04	2.1	0.090
FEB												
25...	6.1	1880	1780	2.56	119	<0.010	<0.100	0.070	0.060	0.08	2.3	0.170
MAY												
04...	6.3	1050	984	1.43	2.27	<0.010	<0.100	0.050	0.050	0.06	2.1	0.180
JUL												
28...	22	733	665	1.0	38.8	0.010	0.140	0.970	0.890	1.1	3.6	0.260

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 18...	0.020	<0.010	<10	2	74	<0.5	<1	<1	<3	3	10
FEB 25...	0.150	0.100	<10	2	200	<10	1	<1	1	1	40
MAY 04...	0.120	0.070	<10	3	100	<0.5	<1	<1	<3	<1	7
JUL 28...	0.510	0.230	<10	9	57	<0.5	<1	<1	<3	1	10

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 18...	<5	49	28	<0.1	<10	4	<1	<1.0	280	<6	7
FEB 25...	<5	140	190	<0.1	3	6	<1	<1.0	880	3	<10
MAY 04...	<5	78	4	0.2	<10	3	<1	<1.0	420	<6	<3
JUL 28...	<5	61	22	0.2	<10	6	<1	<1.0	210	<6	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 07...	--	--	--	--	--	--	--	--	99	19	99
NOV 18...	--	--	--	--	--	--	--	--	58	18	48
FEB 25...	--	--	--	--	--	--	--	--	134	8.5	52
MAY 04...	0.8	0.9	24	1.5	16	1.5	0.09	1.0	61	0.13	99
JUL 28...	--	--	--	--	--	--	--	--	10	0.54	98
AUG 24...	--	--	--	--	--	--	--	--	9	0.50	90

06185500 MISSOURI RIVER NEAR CULBERTSON, MT

LOCATION.--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 downstream side of bridge on State Highway 16, 2.5 mi southeast of Culbertson, 10 mi downstream from Big Muddy Creek, and at mile 1,620.76.

DRAINAGE AREA.--91,557 mi^2.

PERIOD OF RECORD.--July 1941 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. 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. 17 to Apr. 4 and Aug. 17 to Sept. 30. Records good except those for 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. Water-quality records for the current year are also available. These records, which have been published in U.S. Geological Survey Report MT-88-1, can also be accessed through the U.S. Geological Survey's WATSTORE data system.

AVERAGE DISCHARGE.--39 years (1943-51, 1959-88, after operational level at Fort Peck Lake was reached), 10,700 ft^3/s, 7,752,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft^3/s, Mar. 26, 1943, gage height, 14.80 ft, from rating curve extended above 30,000 ft^3/s; maximum gage height observed, 19.66 ft, Apr. 14, 1979 (backwater from ice jam); minimum daily discharge, 575 ft^3/s, Nov. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 17,300 ft^3/s, Mar. 1; minimum daily, 4,100 ft^3/s, Sept. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6660	5380	8500	11200	12300	12800	7000	6160	6730	7070	7480	6500
2	6670	5390	8670	11200	12200	12000	6900	6140	6830	7100	7630	6800
3	6640	5380	9870	11000	12200	11800	6900	6190	6800	6820	7610	6500
4	6600	5360	10700	10800	12300	11800	7200	6290	6700	6920	7530	6000
5	6670	5250	10600	10800	11100	11700	6900	6260	6580	6960	7520	5700
6	6650	5240	10600	10800	11000	11400	6850	5830	6570	7030	7500	5850
7	6580	5360	10500	10800	11200	10100	6740	5840	6630	7260	7320	5650
8	6570	5270	10400	10800	11700	9100	6660	6110	6730	7700	7320	6000
9	6270	5230	10400	10700	11700	8600	6730	6390	6900	7910	7440	5600
10	6120	5280	10300	10600	11500	8800	6720	6880	6920	8180	7480	5400
11	6150	5420	10300	10400	10900	9000	6660	7150	6570	8380	7350	5450
12	6150	5470	10300	10400	11000	8800	6480	7020	6490	8310	7560	5450
13	5980	5200	10300	10600	11700	8600	6370	6990	6370	8260	7700	5600
14	6030	5070	10100	10500	11800	8700	6330	7230	6450	8440	7860	5600
15	6080	5000	10300	10500	11800	8600	6550	7460	6740	8250	7840	5600
16	6220	5420	10200	10600	12100	8200	6660	7510	7030	7980	7950	5800
17	6600	5420	10000	10800	12300	8500	6520	7380	6850	8080	7900	5800
18	6540	5160	9500	10800	12200	8400	6550	7280	6780	8230	7900	5600
19	6050	5180	9000	10800	12700	8400	6710	7340	6950	8150	8000	4900
20	5700	5310	9500	11100	12600	8300	6980	7480	7110	7980	7750	4500
21	5720	5310	10000	11200	12700	8300	7010	7200	7200	7770	7950	4400
22	5970	5150	11000	11300	12500	8300	6820	7390	7390	7600	7950	4450
23	5890	5140	11000	11600	12600	7600	6490	7970	6810	7620	7950	4200
24	5660	5220	11400	12000	12600	7500	6360	7930	6770	7750	7400	4200
25	5640	5380	11300	11800	12500	7300	6450	7030	6630	7710	6800	4250
26	5750	5380	11500	11800	12300	7500	6260	6890	6750	7690	7000	4200
27	5680	5330	11800	12300	12500	8000	6250	7080	6760	7660	7200	4100
28	5330	6050	11500	12700	12400	7300	6300	6850	6900	7610	7000	4200
29	5390	7460	11400	12700	12600	7300	6420	6880	6930	7610	6800	4200
30	5370	8210	11300	12500	---	6800	6370	6830	6900	7640	6400	4200
31	5250	---	11300	12500	---	7200	---	6670	---	7490	6300	---
TOTAL	188580	164420	323540	347600	349000	276700	199140	213650	203770	239160	231390	156700
MEAN	6083	5481	10440	11210	12030	8926	6638	6892	6792	7715	7464	5223
MAX	6670	8210	11800	12700	12700	12800	7200	7970	7390	8440	8000	6800
MIN	5250	5000	8500	10400	10900	6800	6250	5830	6370	6820	6300	4100
AC-FT	374000	326100	641700	689500	692200	548800	395000	423800	404200	474400	459000	310800

CAL YR 1987 TOTAL 2886350 MEAN 7908 MAX 15900 MIN 5000 AC-FT 5725000
WTR YR 1988 TOTAL 2893650 MEAN 7906 MAX 12800 MIN 4100 AC-FT 5740000

06185600 MISSOURI RIVER STAGE GAGE NO. 4 NEAR NOHLY, MT

LOCATION.--Lat 48°02'10", long 104°09'40", in NE1/4 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 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 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.45	9.62	---	---	---	---	---	9.97	10.41	10.66	11.05	10.56
2	10.39	9.67	---	---	---	---	---	9.90	10.47	10.74	11.07	10.52
3	10.41	9.68	---	---	---	---	---	9.95	10.47	10.71	11.17	10.60
4	10.39	---	---	---	---	---	---	9.95	10.42	10.62	11.10	10.70
5	10.40	---	---	---	---	---	---	9.99	10.35	10.69	11.09	10.58
6	10.44	---	---	---	---	---	---	9.81	10.33	10.71	11.10	10.30
7	10.37	---	---	---	---	---	---	9.75	10.39	10.83	11.02	10.22
8	10.40	---	---	---	---	---	---	9.80	10.42	11.00	10.99	10.31
9	10.26	---	---	---	---	---	---	10.02	10.47	11.22	11.01	10.33
10	10.07	---	---	---	---	---	---	10.18	10.63	11.29	11.07	10.27
11	10.05	---	---	---	---	---	---	10.47	10.46	11.36	11.00	10.19
12	10.06	---	---	---	---	---	10.05	10.50	10.42	11.44	11.05	10.15
13	10.02	---	---	---	---	---	9.99	10.43	10.37	11.36	11.15	10.12
14	9.94	---	---	---	---	---	9.95	10.54	10.32	11.42	11.21	10.16
15	10.00	---	---	---	---	---	9.99	10.68	10.45	11.45	11.25	10.20
16	10.06	---	---	---	---	---	10.17	10.71	10.62	11.31	11.27	10.24
17	10.23	---	---	---	---	---	10.11	10.67	10.65	11.28	11.22	10.23
18	10.37	---	---	---	---	---	10.11	10.65	10.60	11.39	11.19	10.43
19	10.21	---	---	---	---	---	10.16	10.63	10.60	11.37	11.25	10.52
20	9.90	---	---	---	---	---	10.31	10.75	10.76	11.31	11.17	10.37
21	9.80	---	---	---	---	---	10.41	10.61	10.76	11.20	11.21	9.98
22	9.86	---	---	---	---	---	10.35	10.68	10.98	11.10	11.22	9.74
23	10.00	---	---	---	---	---	10.22	10.89	10.67	11.08	11.21	9.63
24	9.81	---	---	---	---	---	10.05	11.01	10.61	11.15	11.16	9.60
25	9.78	---	---	---	---	---	10.09	10.63	10.49	11.15	11.14	9.51
26	9.82	---	---	---	---	---	10.03	10.45	10.48	11.15	11.00	9.54
27	9.84	---	---	---	---	---	9.96	10.51	10.53	11.14	10.71	9.54
28	9.71	---	---	---	---	---	9.97	10.49	10.62	11.12	10.76	9.56
29	9.61	---	---	---	---	---	10.03	10.42	10.61	11.13	10.93	9.52
30	9.70	---	---	---	---	---	10.10	10.44	10.70	11.14	10.96	9.57
31	9.53	---	---	---	---	---	---	10.40	---	11.09	10.72	---
MEAN	10.06	---	---	---	---	---	---	10.38	10.54	11.12	11.08	10.11
MAX	10.45	---	---	---	---	---	---	11.01	10.98	11.45	11.27	10.70
MIN	9.53	---	---	---	---	---	---	9.75	10.32	10.62	10.71	9.51

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 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.

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63.14	62.46	---	---	---	---	---	---	64.54	63.43	63.84	63.38
2	63.08	62.52	---	---	---	---	---	---	64.52	63.50	63.83	63.31
3	63.10	62.52	---	---	---	---	---	---	64.50	63.50	63.94	63.37
4	63.10	---	---	---	---	---	---	---	64.40	63.40	63.87	63.46
5	63.09	---	---	---	---	---	---	---	63.85	63.46	63.85	63.41
6	63.14	---	---	---	---	---	---	---	63.54	63.48	63.87	63.16
7	63.08	---	---	---	---	---	---	---	63.45	63.57	63.82	63.06
8	63.11	---	---	---	---	---	---	---	63.80	63.71	63.77	63.13
9	63.05	---	---	---	---	---	---	---	64.50	63.92	63.80	63.14
10	62.99	---	---	---	---	---	---	---	64.89	64.00	63.84	63.13
11	62.94	---	---	---	---	---	---	63.37	64.47	64.10	63.81	63.03
12	62.95	---	---	---	---	---	---	63.67	64.16	64.14	63.82	63.01
13	62.93	---	---	---	---	---	---	63.44	63.89	64.10	63.92	62.98
14	62.84	---	---	---	---	---	---	63.32	63.66	64.13	63.98	63.01
15	62.90	---	---	---	---	---	---	63.45	63.66	64.18	64.01	63.02
16	62.96	---	---	---	---	---	---	63.52	63.72	64.07	64.02	63.05
17	63.09	---	---	---	---	---	---	63.59	63.71	64.01	64.00	63.04
18	63.24	---	---	---	---	---	---	63.82	63.58	64.14	63.96	63.18
19	63.15	---	---	---	---	---	---	63.87	63.48	64.13	64.03	63.34
20	62.84	---	---	---	---	---	---	63.83	63.54	64.08	63.96	63.23
21	62.73	---	---	---	---	---	---	64.22	63.53	64.00	63.98	62.90
22	62.75	---	---	---	---	---	---	64.29	63.69	63.91	64.00	62.67
23	62.88	---	---	---	---	---	---	64.26	63.51	63.87	63.98	62.55
24	62.72	---	---	---	---	---	---	64.19	63.38	63.93	63.92	62.52
25	62.67	---	---	---	---	---	---	63.80	63.30	63.94	63.89	62.44
26	62.72	---	---	---	---	---	---	63.46	63.28	63.92	63.80	62.44
27	62.75	---	---	---	---	---	---	63.50	63.30	63.92	63.53	62.43
28	62.63	---	---	---	---	---	---	63.72	63.39	63.89	63.52	62.43
29	62.48	---	---	---	---	---	---	63.96	63.38	63.90	63.68	62.42
30	62.57	---	---	---	---	---	---	64.38	63.49	63.92	63.73	62.43
31	62.42	---	---	---	---	---	---	64.47	---	63.88	63.55	---
MEAN	62.90	---	---	---	---	---	---	---	63.80	63.88	63.86	62.96
MAX	63.24	---	---	---	---	---	---	---	64.89	64.18	64.03	63.46
MIN	62.42	---	---	---	---	---	---	---	63.28	63.40	63.52	62.42

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT

LOCATION.--Lat 47°40'42", long 104°09'22", in SW1/4NE1/4SW1/4 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 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. 15 to Mar. 24. Water-discharge records good except those for 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 NW1/4 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. Water-quality records for the current year are also available. These records, which have been published in U.S. Geological Survey Report MT-88-1, can also be accessed through the U.S. Geological Survey's WATSTORE data system.

AVERAGE DISCHARGE.--76 years, 12,890 ft^3/s, 9,340,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 159,000 ft^3/s, June 2, 1921, gage height, 12.6 ft, sit and datum then in use; maximum gage height observed, 21.85 ft, Mar. 22, 1947, site and datum then in use (backwater 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, 33,000 ft^3/s, June 9, gage height, 11.07 ft; minimum, 1,340 ft^3/s, Aug. 17, gage height, 3.11 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5780	6680	6830	4000	6000	8000	6150	6000	28800	9800	1740	1890
2	5850	6650	7010	4500	5500	8000	6180	5730	28100	9200	1700	1990
3	5950	6620	6570	4500	5000	8000	6080	5620	28200	8890	1670	2010
4	5910	6650	6770	4000	5000	8000	5910	5820	24900	8150	1700	2000
5	5750	6680	6550	3500	5500	8000	5840	6560	20600	7760	1760	2020
6	5620	6700	6450	4000	6000	7500	5710	6850	18300	7090	1680	2030
7	5530	6770	6520	4500	5500	7000	5680	6500	19600	6660	1530	2050
8	5420	6770	6500	4500	5500	7000	5560	6170	27500	6370	1530	2110
9	5400	6770	6440	4000	6000	7000	5600	6110	32200	5970	1560	2140
10	5440	6770	6480	4500	5000	7000	5640	10200	30800	5480	1620	2170
11	5440	6840	6410	5000	4500	6500	5520	22000	27800	5210	1580	2150
12	5370	6850	6390	5500	5000	6500	5590	17800	25100	4950	1450	2260
13	5520	6830	6360	6000	5500	6500	5790	14100	22100	4730	1480	2320
14	5710	6830	6430	6500	5500	6500	5920	12700	20600	4510	1650	2590
15	5820	6790	4000	7500	5500	6500	5680	12300	19500	4310	1700	3110
16	5840	6740	3000	8000	6000	6000	5440	14500	18600	4050	1540	3550
17	5920	6740	2500	7500	6000	6000	5330	18500	17600	3830	1460	3810
18	6010	6740	3000	7000	6500	6500	5400	20800	15600	3770	1710	4290
19	6010	6740	3500	6500	7000	7000	5530	18900	14200	3690	1800	5050
20	6010	6750	3500	6500	8000	7500	5430	20100	13600	3760	1680	4710
21	5980	6760	4000	6500	9000	7500	5990	24800	13200	3690	1420	4590
22	6000	6650	4000	7000	8500	7500	6170	24100	13300	3490	1390	4690
23	6030	6680	3500	7500	7500	7000	6770	21200	13300	3360	1410	4940
24	5640	6740	3500	8000	8000	7000	7320	18300	12600	3270	1430	4710
25	6510	6740	4000	7500	8500	7020	7240	16400	12600	3090	1550	4660
26	6680	6770	4000	7000	9000	6920	6840	16400	12500	2860	1630	4420
27	6690	6770	4500	7500	9000	6820	6400	18500	12000	2670	1650	4570
28	6710	6740	4500	8000	9000	6610	6160	21900	11400	2420	1640	4630
29	6710	6670	4500	9000	8000	6500	6440	26000	10800	2210	1640	4630
30	6710	6860	4000	8000	---	6260	6300	28300	11000	2020	1650	4600
31	6710	---	4000	7000	---	6160	---	29200	---	1770	1790	---
TOTAL	184670	202290	155710	191000	191000	216290	179610	482360	576400	149030	49740	100690
MEAN	5957	6743	5023	6161	6586	6977	5987	15560	19210	4807	1605	3356
MAX	6710	6860	7010	9000	9000	8000	7320	29200	32200	9800	1800	5050
MIN	5370	6620	2500	3500	4500	6000	5330	5620	10800	1770	1390	1890
AC-FT	366300	401200	308900	378800	378800	429000	356300	956800	1143000	295600	98660	199700

CAL YR 1987 TOTAL 2937690 MEAN 8048 MAX 22100 MIN 2500 AC-FT 5827000
WTR YR 1988 TOTAL 2678790 MEAN 7319 MAX 32200 MIN 1390 AC-FT 5313000

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.

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	10.70	---	---	---	---	---	10.27	16.52	---	8.18	---
2	---	10.67	---	---	---	---	---	10.15	16.38	---	8.15	---
3	---	---	---	---	---	---	---	10.12	16.36	---	8.14	---
4	---	---	---	---	---	---	---	10.14	15.87	---	8.11	---
5	---	---	---	---	---	---	---	10.44	14.89	---	8.15	---
6	---	---	---	---	---	---	---	10.66	14.23	---	8.13	---
7	---	---	---	---	---	---	---	10.51	14.25	---	8.04	---
8	10.04	---	---	---	---	---	---	10.35	15.85	---	8.01	8.36
9	10.07	---	---	---	---	---	---	10.26	17.00	---	8.01	8.44
10	10.10	---	---	---	---	---	---	10.86	16.88	---	8.05	8.51
11	10.09	---	---	---	---	---	---	14.71	16.25	---	8.08	8.48
12	10.07	---	---	---	---	---	---	14.69	15.75	---	7.96	8.57
13	10.09	---	---	---	---	---	---	13.62	15.17	---	7.98	---
14	10.20	---	---	---	---	---	10.21	---	14.75	9.74	8.01	---
15	10.25	---	---	---	---	---	10.15	---	14.52	9.66	8.16	---
16	10.27	---	---	---	---	---	10.02	---	14.26	9.53	7.99	---
17	10.29	---	---	---	---	---	9.96	---	14.08	9.45	7.92	---
18	10.34	---	---	---	---	---	9.97	---	13.60	9.41	8.08	---
19	10.32	---	---	---	---	---	10.06	---	13.17	9.35	8.14	---
20	10.36	---	---	---	---	---	9.98	14.55	12.96	9.37	8.15	---
21	10.34	---	---	---	---	---	10.20	15.71	12.81	9.35	7.96	---
22	10.35	---	---	---	---	---	10.35	15.75	12.79	9.23	7.94	---
23	10.37	---	---	---	---	---	10.45	15.11	12.79	9.14	7.94	---
24	10.28	---	---	---	---	---	10.85	14.34	12.62	9.10	7.96	---
25	10.44	---	---	---	---	---	10.82	13.74	12.56	8.99	8.03	---
26	10.64	---	---	---	---	---	10.69	13.65	12.57	8.86	8.06	---
27	10.68	---	---	---	---	---	10.53	14.10	12.41	8.74	8.10	---
28	10.69	---	---	---	---	---	10.35	14.89	---	8.60	8.10	---
29	10.70	---	---	---	---	---	10.43	15.84	---	8.49	8.09	---
30	10.71	---	---	---	---	---	10.40	16.37	---	8.36	8.04	---
31	10.70	---	---	---	---	---	---	16.56	---	8.25	8.14	---
MEAN	---	---	---	---	---	---	---	---	---	---	8.06	---
MAX	---	---	---	---	---	---	---	---	---	---	8.18	---
MIN	---	---	---	---	---	---	---	---	---	---	7.92	---

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.

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64.87	65.09	---	---	---	---	---	---	71.05	66.56	63.62	63.60
2	64.87	65.08	---	---	---	---	---	---	70.94	66.35	63.59	63.61
3	64.93	---	---	---	---	---	---	---	70.88	66.31	63.59	63.64
4	64.90	---	---	---	---	---	---	---	70.54	66.08	63.57	63.66
5	64.89	---	---	---	---	---	---	---	69.62	65.94	63.63	63.67
6	64.82	---	---	---	---	---	---	---	68.98	65.73	63.65	63.67
7	64.73	---	---	---	---	---	---	---	68.90	65.56	63.54	63.65
8	64.66	---	---	---	---	---	---	---	70.29	65.46	63.50	63.63
9	64.74	---	---	---	---	---	---	---	71.50	65.32	63.54	63.68
10	64.79	---	---	---	---	---	---	---	71.47	65.14	63.58	63.67
11	64.74	---	---	---	---	---	---	---	70.89	---	63.59	63.64
12	64.77	---	---	---	---	---	---	---	70.34	---	63.53	63.74
13	64.70	---	---	---	---	---	---	---	69.77	---	63.51	63.78
14	64.72	---	---	---	---	---	---	---	69.30	64.68	63.55	63.84
15	64.76	---	---	---	---	---	---	---	69.08	64.61	63.64	63.98
16	64.80	---	---	---	---	---	---	---	68.82	64.52	63.57	64.20
17	64.82	---	---	---	---	---	---	---	68.69	64.39	63.47	64.31
18	64.82	---	---	---	---	---	---	---	68.26	64.37	63.55	64.45
19	64.80	---	---	---	---	---	---	---	67.82	64.32	63.60	64.72
20	64.82	---	---	---	---	---	---	---	67.61	64.34	63.60	64.76
21	64.82	---	---	---	---	---	---	---	67.47	64.38	63.51	64.68
22	64.82	---	---	---	---	---	---	---	67.42	64.35	63.47	64.65
23	64.84	---	---	---	---	---	---	---	67.48	64.22	63.47	64.78
24	64.76	---	---	---	---	---	---	---	67.32	64.22	63.50	64.73
25	64.86	---	---	---	---	---	---	68.49	67.20	64.18	63.50	64.66
26	---	---	---	---	---	---	---	68.33	67.23	64.12	63.49	64.59
27	---	---	---	---	---	---	---	68.71	67.13	64.07	63.50	64.55
28	---	---	---	---	---	---	---	69.44	67.00	63.98	63.51	64.58
29	---	---	---	---	---	---	---	70.31	66.78	63.86	63.53	64.56
30	64.94	---	---	---	---	---	---	70.91	66.80	63.79	63.53	64.55
31	65.03	---	---	---	---	---	---	71.06	---	63.71	63.56	---
MEAN	---	---	---	---	---	---	---	---	68.89	---	63.55	64.14
MAX	---	---	---	---	---	---	---	---	71.50	---	63.65	64.78
MIN	---	---	---	---	---	---	---	---	66.78	---	63.47	63.60

06329620 YELLOWSTONE RIVER STAGE GAGE NO. 3 NEAR BUFORD, ND

LOCATION.--Lat 47°55'14", long 103°57'56", in SW1/4 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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	12.36	8.27	8.43
2	---	---	---	---	---	---	---	---	---	12.10	---	8.47
3	---	---	---	---	---	---	---	---	---	12.03	---	8.54
4	---	---	---	---	---	---	---	---	---	11.81	---	8.57
5	---	---	---	---	---	---	---	---	---	11.64	---	8.59
6	---	---	---	---	---	---	---	---	---	11.45	---	8.59
7	---	---	---	---	---	---	---	---	---	11.24	---	8.56
8	---	---	---	---	---	---	---	---	---	11.10	---	8.60
9	---	---	---	---	---	---	---	---	---	10.92	---	8.65
10	---	---	---	---	---	---	---	---	---	10.70	---	8.68
11	---	---	---	---	---	---	---	---	---	10.50	8.25	8.67
12	---	---	---	---	---	---	---	---	---	10.31	8.18	8.78
13	---	---	---	---	---	---	---	---	---	10.17	8.16	8.82
14	---	---	---	---	---	---	---	---	---	10.01	8.20	8.87
15	---	---	---	---	---	---	---	---	---	9.91	8.38	9.07
16	---	---	---	---	---	---	---	---	14.80	9.77	8.25	9.41
17	---	---	---	---	---	---	---	---	14.65	9.65	8.14	9.63
18	---	---	---	---	---	---	---	---	14.20	9.60	8.22	9.90
19	---	---	---	---	---	---	---	15.28	13.73	9.53	8.35	10.22
20	---	---	---	---	---	---	---	14.97	13.46	9.51	8.37	10.40
21	---	---	---	---	---	---	---	16.07	13.29	9.54	8.29	10.24
22	---	---	---	---	---	---	---	16.47	13.23	9.43	8.24	10.16
23	---	---	---	---	---	---	---	15.90	13.24	9.30	8.23	10.28
24	---	---	---	---	---	---	---	15.11	13.09	9.29	8.24	10.24
25	---	---	---	---	---	---	---	14.43	12.94	9.19	8.27	10.13
26	---	---	---	---	---	---	---	14.19	12.97	9.07	8.30	10.01
27	---	---	---	---	---	---	---	14.47	12.84	8.94	8.32	9.93
28	---	---	---	---	---	---	---	15.23	12.72	8.82	8.33	9.97
29	---	---	---	---	---	---	---	16.18	12.53	8.66	8.35	9.90
30	---	---	---	---	---	---	---	16.89	12.56	8.54	8.31	9.85
31	---	---	---	---	---	---	---	---	---	8.41	8.35	---
MEAN	---	---	---	---	---	---	---	---	---	10.11	---	9.34
MAX	---	---	---	---	---	---	---	---	---	12.36	---	10.40
MIN	---	---	---	---	---	---	---	---	---	8.41	---	8.43

06329640 MISSOURI RIVER STAGE GAGE NO. 5A AT BUFORD, ND

LOCATION.--Lat 47°59'06", long 103°59'05", in SE1/4 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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.61	6.34	---	---	---	---	---	6.79	13.31	8.85	5.81	5.65
2	6.58	6.34	---	---	---	---	---	6.58	13.23	8.58	5.78	5.62
3	6.58	---	---	---	---	---	---	6.55	13.16	8.49	5.88	---
4	6.52	---	---	---	---	---	---	6.53	12.95	8.22	5.86	---
5	6.49	---	---	---	---	---	---	6.73	12.02	8.05	5.86	---
6	6.47	---	---	---	---	---	---	6.95	11.15	7.83	5.89	---
7	6.44	---	---	---	---	---	---	6.86	10.82	7.67	5.82	---
8	6.32	---	---	---	---	---	---	6.69	11.86	7.62	5.78	5.49
9	6.35	---	---	---	---	---	---	6.72	13.35	7.61	5.76	5.57
10	6.23	---	---	---	---	---	---	6.96	13.74	7.51	5.79	5.59
11	6.18	---	---	---	---	---	---	10.05	13.23	7.42	5.80	5.48
12	6.17	---	---	---	---	---	---	11.26	12.68	7.31	5.76	5.54
13	6.13	---	---	---	---	---	6.64	10.38	12.14	7.14	5.81	5.54
14	6.19	---	---	---	---	---	6.69	9.65	11.59	7.04	5.89	5.61
15	6.27	---	---	---	---	---	6.68	9.33	11.39	7.01	6.02	5.78
16	6.33	---	---	---	---	---	6.64	9.59	11.17	6.84	5.96	6.07
17	6.40	---	---	---	---	---	6.56	10.42	11.06	6.72	5.91	6.25
18	6.56	---	---	---	---	---	6.53	11.49	10.62	6.73	5.91	6.59
19	6.52	---	---	---	---	---	6.60	11.65	10.11	6.69	6.02	7.04
20	6.36	---	---	---	---	---	6.64	11.33	9.92	6.66	6.02	7.19
21	6.21	---	---	---	---	---	6.82	12.17	9.75	6.63	5.96	6.76
22	6.21	---	---	---	---	---	7.02	12.69	9.76	6.48	5.97	6.44
23	6.32	---	---	---	---	---	7.04	12.34	9.72	6.33	5.98	6.41
24	6.25	---	---	---	---	---	7.32	11.76	9.48	6.37	5.97	6.35
25	6.09	---	---	---	---	---	7.40	11.02	9.27	6.34	5.96	6.15
26	6.36	---	---	---	---	---	7.33	10.57	9.29	6.26	5.93	6.02
27	6.50	---	---	---	---	---	7.10	10.77	9.16	6.19	5.71	5.96
28	6.47	---	---	---	---	---	6.89	11.49	9.09	6.11	5.70	6.00
29	6.37	---	---	---	---	---	6.87	12.32	8.90	6.03	5.84	5.93
30	6.43	---	---	---	---	---	6.93	13.02	9.00	5.99	5.89	5.88
31	6.34	---	---	---	---	---	---	13.28	---	5.91	5.79	---
MEAN	6.36	---	---	---	---	---	---	9.80	11.10	7.05	5.87	---
MAX	6.61	---	---	---	---	---	---	13.28	13.74	8.85	6.02	---
MIN	6.09	---	---	---	---	---	---	6.53	8.90	5.91	5.70	---

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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.95	13.58	---	---	---	---	---	13.89	20.49	16.08	13.01	12.58
2	13.90	13.61	---	---	---	---	---	13.71	20.44	15.82	12.97	12.54
3	13.88	13.62	---	---	---	---	---	13.64	20.34	15.73	13.02	12.61
4	13.87	---	---	---	---	---	---	13.59	20.17	15.50	12.98	12.71
5	13.83	---	---	---	---	---	---	13.75	19.28	15.35	12.96	12.74
6	13.81	---	---	---	---	---	---	13.99	18.38	15.17	12.97	12.52
7	13.77	---	---	---	---	---	---	13.95	17.97	15.01	12.90	12.36
8	13.69	---	---	---	---	---	---	13.81	18.86	14.94	12.83	12.41
9	13.68	---	---	---	---	---	---	13.78	20.45	14.93	12.81	12.49
10	13.56	---	---	---	---	---	---	13.94	20.94	14.84	12.85	12.55
11	13.50	---	---	---	---	---	---	16.79	20.53	14.75	12.88	12.47
12	13.48	---	---	---	---	---	13.73	18.33	19.95	14.63	12.83	12.48
13	13.46	---	---	---	---	---	13.70	17.45	19.40	14.47	12.87	12.48
14	13.46	---	---	---	---	---	13.73	16.66	18.85	14.35	12.94	12.52
15	13.54	---	---	---	---	---	13.72	16.29	18.61	14.32	13.06	12.66
16	13.61	---	---	---	---	---	13.68	16.41	18.36	14.17	13.01	12.91
17	13.67	---	---	---	---	---	13.63	17.18	18.23	14.04	12.97	13.10
18	13.84	---	---	---	---	---	13.59	18.28	17.84	14.05	12.92	13.39
19	13.85	---	---	---	---	---	13.64	18.59	17.32	14.01	13.03	13.79
20	13.71	---	---	---	---	---	13.70	18.28	17.06	13.95	13.03	13.97
21	13.54	---	---	---	---	---	13.83	18.99	16.89	13.91	12.97	13.61
22	13.52	---	---	---	---	---	14.02	19.65	16.84	13.77	12.95	13.29
23	13.60	---	---	---	---	---	14.04	19.39	16.83	13.64	12.94	13.24
24	13.56	---	---	---	---	---	14.29	18.81	16.61	13.62	12.93	13.23
25	13.40	---	---	---	---	---	14.39	18.09	16.41	13.61	12.91	13.05
26	13.68	---	---	---	---	---	14.34	17.59	16.40	13.52	12.89	12.95
27	13.78	---	---	---	---	---	14.13	17.70	16.32	13.43	12.68	12.89
28	13.78	---	---	---	---	---	13.92	18.41	16.25	13.34	12.63	12.93
29	13.66	---	---	---	---	---	13.88	19.28	16.09	13.26	12.72	12.86
30	13.67	---	---	---	---	---	13.99	20.02	16.18	13.19	12.77	12.82
31	13.62	---	---	---	---	---	---	20.38	---	13.12	12.71	---
MEAN	13.67	---	---	---	---	---	---	16.79	18.28	14.34	12.90	12.87
MAX	13.95	---	---	---	---	---	---	20.38	20.94	16.08	13.06	13.97
MIN	13.40	---	---	---	---	---	---	13.59	16.09	13.12	12.63	12.36

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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.25	---	---	---	---	---	---	10.25	16.65	12.35	---	9.13
2	10.17	---	---	---	---	---	---	10.09	16.64	12.08	---	9.08
3	10.18	---	---	---	---	---	---	10.00	16.50	11.99	---	9.16
4	10.18	---	---	---	---	---	---	9.94	16.32	11.79	---	9.24
5	10.13	---	---	---	---	---	---	10.06	15.49	11.62	---	9.29
6	10.12	---	---	---	---	---	---	10.30	14.63	11.47	---	9.10
7	10.10	---	---	---	---	---	---	10.28	14.18	11.29	---	8.94
8	10.11	---	---	---	---	---	---	10.18	14.91	11.22	---	8.99
9	10.12	---	---	---	---	---	---	10.11	16.34	11.21	---	9.03
10	---	---	---	---	---	---	---	10.34	16.96	11.13	---	9.07
11	---	---	---	---	---	---	---	12.88	16.73	11.02	9.36	9.03
12	---	---	---	---	---	---	10.11	14.51	16.17	10.96	9.32	9.04
13	---	---	---	---	---	---	10.08	13.76	15.64	10.83	9.35	9.04
14	---	---	---	---	---	---	10.10	13.06	15.10	10.71	9.43	9.06
15	---	---	---	---	---	---	10.08	12.63	14.83	10.68	9.52	9.17
16	---	---	---	---	---	---	10.07	12.62	14.57	10.55	9.52	9.41
17	---	---	---	---	---	---	10.02	13.28	14.45	10.40	9.46	9.59
18	10.17	---	---	---	---	---	9.96	14.37	14.12	10.41	9.40	9.85
19	10.18	---	---	---	---	---	10.02	14.77	13.62	10.39	9.51	10.20
20	---	---	---	---	---	---	10.07	14.52	13.34	10.32	9.51	10.37
21	---	---	---	---	---	---	10.17	15.10	13.19	10.29	9.50	10.09
22	---	---	---	---	---	---	10.36	15.88	13.11	10.17	9.47	9.79
23	---	---	---	---	---	---	10.40	15.55	13.13	10.05	9.45	9.69
24	---	---	---	---	---	---	10.62	14.45	12.94	10.03	9.43	9.70
25	---	---	---	---	---	---	10.72	14.47	12.71	10.02	9.41	9.50
26	10.15	---	---	---	---	---	10.69	13.78	12.66	9.94	9.40	9.41
27	10.16	---	---	---	---	---	10.49	13.90	12.61	9.85	9.22	9.31
28	10.14	---	---	---	---	---	10.28	14.59	12.54	9.78	9.15	9.36
29	---	---	---	---	---	---	10.21	15.38	12.36	9.70	9.24	9.31
30	---	---	---	---	---	---	10.34	16.11	12.45	9.63	9.31	9.26
31	---	---	---	---	---	---	---	16.50	---	---	9.25	---
MEAN	---	---	---	---	---	---	---	13.02	14.50	---	---	9.37
MAX	---	---	---	---	---	---	---	16.50	16.96	---	---	10.37
MIN	---	---	---	---	---	---	---	9.94	12.36	---	---	8.94

06330000 MISSOURI RIVER NEAR WILLISTON, ND

LOCATION.--Lat 48°06'45", long 103°43'04", in SE1/4 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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.35	14.23	14.97	17.29	18.44	19.28	14.37	14.18	18.69	15.73	13.45	13.08
2	14.38	14.21	15.14	17.03	18.40	19.31	14.35	14.05	18.76	15.57	13.38	13.01
3	14.35	14.19	15.17	16.64	18.18	19.20	14.34	13.99	18.75	15.41	13.36	13.01
4	14.24	14.15	15.25	16.16	17.93	19.11	14.25	14.00	18.72	15.33	13.40	13.09
5	14.23	14.21	15.43	15.81	17.75	19.12	14.18	14.12	18.36	15.17	13.36	13.15
6	14.29	14.22	15.40	15.92	---	19.18	14.15	14.35	---	15.02	13.34	13.09
7	14.31	14.19	15.39	16.23	---	19.27	14.10	14.29	---	14.90	13.30	12.89
8	14.20	14.24	15.34	16.17	---	19.30	14.00	14.15	---	14.84	13.29	12.82
9	14.17	14.28	15.33	16.24	---	19.24	13.98	14.09	---	14.81	13.24	12.91
10	14.14	14.25	15.27	16.47	---	19.07	14.02	14.14	---	14.78	13.25	13.04
11	14.09	14.25	15.23	16.73	---	18.90	14.04	15.31	---	14.77	13.28	12.99
12	14.08	14.30	15.27	16.94	---	18.73	14.00	17.03	---	14.67	13.27	12.91
13	14.01	14.32	15.30	17.03	---	18.64	14.00	16.89	18.34	14.51	13.24	12.93
14	14.06	14.29	---	17.14	---	18.51	14.01	16.37	17.98	14.45	13.33	12.94
15	14.16	14.18	---	17.25	---	18.27	14.06	15.99	17.66	14.36	13.41	13.04
16	14.16	14.16	---	17.24	---	18.06	13.99	15.94	17.47	14.31	13.44	13.19
17	14.17	14.22	---	17.47	18.44	17.95	13.98	16.27	17.30	14.18	13.36	13.34
18	14.26	14.23	---	17.82	18.55	17.86	13.92	16.80	17.09	14.15	13.36	13.53
19	14.31	14.18	---	18.08	18.66	17.85	13.95	17.33	16.68	14.15	13.43	13.83
20	14.24	14.20	17.12	18.26	18.77	17.89	14.06	17.32	16.45	14.12	13.47	14.03
21	14.15	14.21	17.20	18.31	18.84	17.92	14.08	17.46	16.29	14.09	13.36	13.91
22	14.10	14.19	17.31	18.29	18.84	18.12	14.26	18.00	16.20	14.03	13.32	13.62
23	14.16	14.15	17.54	18.24	18.88	18.22	14.32	18.14	16.17	13.89	13.34	13.49
24	14.22	14.13	17.36	18.21	18.95	17.55	14.36	17.88	16.03	13.86	13.34	13.50
25	14.06	14.16	17.21	18.23	18.90	16.14	14.50	17.42	15.90	13.87	13.33	13.44
26	14.10	14.20	17.13	18.25	18.70	15.12	14.52	16.92	15.90	13.80	13.29	13.31
27	14.28	14.23	17.12	18.24	18.70	14.93	14.43	16.75	15.89	13.71	13.21	13.30
28	14.32	14.21	17.16	18.20	18.95	14.66	14.28	16.95	15.80	13.64	13.07	13.31
29	14.26	14.34	17.33	18.21	19.15	14.58	14.20	17.48	15.76	13.57	13.14	13.27
30	14.28	14.59	17.43	18.29	---	14.47	14.20	18.04	15.74	13.52	13.24	13.20
31	14.26	---	17.45	18.36	---	14.36	---	18.47	---	13.48	13.18	---
MEAN	14.21	14.23	---	17.38	---	17.77	14.16	16.13	---	14.41	13.32	13.24
MAX	14.38	14.59	---	18.36	---	19.31	14.52	18.47	---	15.73	13.47	14.03
MIN	14.01	14.13	---	15.81	---	14.36	13.92	13.99	---	13.48	13.07	12.82

06330110 MISSOURI RIVER STAGE GAGE NO. 9 AT WILLISTON, ND

LOCATION.--Lat 48°08'13", long 103°36'16", in NE¼NE¼ 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.

PERIOD OF RECORD.--April 1959 to current year (seasonal).

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.45	22.43	22.80	25.17	---	---	22.44	21.89	25.25	23.15	21.49	---
2	22.52	22.27	23.01	25.08	---	---	22.40	21.80	25.33	23.08	21.38	---
3	22.48	22.24	23.17	---	---	---	22.37	21.85	25.35	22.89	21.36	---
4	22.30	22.17	23.26	---	---	---	22.31	21.91	25.44	22.83	21.40	---
5	22.23	22.24	23.42	---	---	---	22.37	22.26	25.41	22.74	21.39	---
6	22.30	22.30	23.46	---	---	---	22.24	22.44	24.93	22.54	21.37	---
7	22.43	22.21	23.42	---	---	---	22.17	22.20	24.37	22.45	---	---
8	22.21	22.20	23.27	---	---	---	21.96	21.88	24.40	22.39	---	---
9	22.11	22.40	23.25	---	---	---	21.96	21.94	24.81	22.36	---	---
10	22.23	22.39	23.18	---	---	---	22.05	21.99	25.30	22.36	---	---
11	22.20	22.28	22.99	---	---	---	22.14	22.64	25.43	22.55	---	---
12	22.18	22.29	23.04	---	---	---	22.09	23.94	25.26	22.38	---	---
13	22.05	22.35	23.37	---	---	---	21.99	24.16	25.06	22.20	---	---
14	22.19	22.45	23.36	---	---	---	22.01	23.78	24.81	22.13	---	---
15	22.40	22.21	23.13	---	---	---	22.13	23.33	24.58	22.06	---	---
16	22.20	22.18	23.55	---	---	---	22.01	23.45	24.52	22.01	21.35	---
17	22.21	22.24	24.02	---	---	---	21.90	23.87	24.32	21.89	21.39	---
18	22.24	22.39	24.05	---	---	---	21.91	23.91	24.12	21.90	21.38	---
19	22.25	22.32	24.14	---	---	---	21.92	24.30	23.86	21.87	21.39	21.52
20	22.24	22.44	24.30	---	---	---	22.04	24.36	23.77	21.87	21.40	21.77
21	22.37	22.45	24.41	---	---	---	22.02	24.40	23.51	21.83	---	21.80
22	22.15	22.34	24.50	---	---	---	22.18	24.73	23.53	21.85	---	21.56
23	22.21	22.27	24.61	---	---	---	22.24	24.94	23.47	21.59	---	21.49
24	22.41	22.25	24.64	---	---	---	22.08	24.91	23.25	21.70	---	21.49
25	22.23	22.28	24.52	---	---	---	22.23	24.56	23.19	21.71	---	21.49
26	22.05	22.28	24.47	---	---	---	22.30	24.15	23.66	21.66	---	21.44
27	22.24	22.31	24.45	---	---	---	22.27	24.00	23.32	21.60	---	21.47
28	22.35	22.32	24.46	---	---	---	22.23	24.06	23.15	21.56	---	21.49
29	22.32	22.42	24.56	---	---	---	22.17	24.50	23.46	21.48	---	21.45
30	22.40	22.77	24.68	---	---	22.42	21.98	24.96	23.26	21.50	---	21.44
31	22.40	---	24.77	---	---	22.39	---	25.13	---	21.46	---	---
MEAN	22.28	22.32	23.81	---	---	---	22.14	23.49	24.34	22.12	---	---
MAX	22.52	22.77	24.77	---	---	---	22.44	25.13	25.44	23.15	---	---
MIN	22.05	22.17	22.80	---	---	---	21.90	21.80	23.15	21.46	---	---

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 mi^2, approximately, of which about 100 mi^2 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. 1-18, 22-24, Mar. 11-15, and May 16-18. Records good except those for periods 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 ft^3/s, 28,110 acre-ft/yr; median of yearly mean discharges, 31 ft^3/s, 22,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,180 ft^3/s, Apr. 18, 1979, gage height, 12.77 ft; maximum gage height, 13.57 ft, Mar. 27, 1960; minimum discharge, 0.20 ft^3/s, Nov. 27, 1960, Feb. 5, 1963, and June 4, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30 ft^3/s, Mar.28, gage height, 5.35 ft; maximum gage height, 5.65 ft, Mar. 12, backwater from ice; minimum daily discharge, 1.7 ft^3/s, July 26, but may have been less during period of nonoperation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					4.0	11	15	9.2	5.4	4.9	2.1	2.4
2					3.7	13	15	12	5.2	4.8	2.2	2.4
3					3.5	12	15	12	5.0	4.4	2.2	2.4
4					3.4	12	15	12	4.6	4.1	2.4	2.4
5					3.2	13	15	12	4.1	4.1	2.4	2.6
6					3.1	14	14	11	3.6	4.0	2.4	2.7
7					3.0	15	15	12	3.5	3.6	2.3	2.4
8					2.8	16	15	12	3.2	3.2	2.2	2.5
9					2.7	18	12	11	2.7	2.9	2.2	2.5
10					2.6	20	12	10	2.7	2.7	2.4	2.6
11					2.6	18	13	11	2.6	2.7	2.4	2.5
12					2.7	14	12	11	2.4	3.0	2.5	2.7
13					2.8	11	11	10	2.3	3.0	2.7	2.9
14					3.0	10	10	11	5.8	2.5	3.3	2.9
15					3.2	9.5	10	11	6.8	2.2	3.4	2.9
16					3.6	10	9.1	8.5	5.8	1.9	2.9	2.9
17					4.2	10	8.5	7.5	5.0	1.8	2.7	3.2
18					4.8	11	8.8	8.0	4.2	2.3	2.7	4.5
19					5.3	12	8.8	8.1	4.1	2.8	2.9	5.7
20					4.8	13	8.7	8.2	4.1	2.8	2.9	5.7
21					5.0	15	8.6	8.2	4.5	2.5	2.8	5.6
22					4.8	17	8.4	8.0	4.0	2.4	2.7	5.0
23					4.5	19	8.6	7.7	3.3	2.2	2.4	4.5
24					4.2	21	8.9	7.1	2.9	2.0	2.3	4.5
25					4.7	20	8.6	6.5	2.6	1.8	2.2	4.5
26					5.4	18	8.3	6.1	2.5	1.7	2.2	4.5
27					6.6	20	8.2	6.1	2.3	2.0	2.4	4.3
28					7.8	19	8.4	6.6	2.2	2.1	2.4	4.1
29					8.2	17	8.2	6.7	2.3	2.2	2.4	4.1
30					---	15	8.5	6.0	3.5	2.2	2.4	4.3
31					---	13	---	5.7	---	2.0	2.4	---
TOTAL					120.2	456.5	327.6	282.2	113.2	86.8	77.8	106.2
MEAN					4.14	14.7	10.9	9.10	3.77	2.80	2.51	3.54
MAX					8.2	21	15	12	6.8	4.9	3.4	5.7
MIN					2.6	9.5	8.2	5.7	2.2	1.7	2.1	2.4
AC-FT					238	905	650	560	225	172	154	211

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
FEB											
18...	1240	4.6	2420	--	6.0	1.0	--	--	--	--	--
MAR											
01...	1330	11	2000	7.85	3.5	1.0	440	82	57	310	60
17...	1125	11	1890	--	2.0	1.5	--	--	--	--	--
APR											
15...	0820	10	1900	--	5.0	8.5	--	--	--	--	--
MAY											
17...	1210	7.3	2240	--	27.5	16.0	--	--	--	--	--
JUN											
14...	1215	7.1	2300	8.32	16.0	16.0	430	51	73	420	67
JUL											
13...	1250	3.1	2420	--	27.5	20.5	--	--	--	--	--
AUG											
11...	1350	2.4	2250	--	29.0	18.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
01...	7	9.4	590	540	9.6	0.30	16	1830	1380	55.8	2.49
JUN											
14...	9	11	630	690	12	0.40	11	1640	1670	31.3	2.23

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)
MAR										
01...	2	120	10	<1	69	10	0.1	2	1	780
JUN										
14...	6	240	30	<1	90	20	0.2	4	<1	830

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 mi^2.

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: Dec. 3 to Mar. 20, May 18 to June 2, and Sept. 13-30. Records poor.

AVERAGE DISCHARGE.--22 years, 7.73 ft^3/s, 5,600 acre-ft/yr; median of yearly mean discharges, 7.9 ft^3/s, 5,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,840 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 13	1130	ice jam	*4.45	Mar. 22	0045	*12	3.86

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.15	.15	.00	.00	.05	1.3	.25	.22	.43	.13	.09
2	.22	.14	.15	.00	.00	.07	1.4	.98	.20	.18	.15	.09
3	.22	.14	.14	.00	.00	.12	1.3	.48	.13	.21	.14	.09
4	.21	.15	.14	.00	.00	.18	1.4	.92	.08	.27	.12	.07
5	.20	.15	.13	.00	.00	.25	1.4	.61	.05	.22	.12	.09
6	.19	.15	.13	.00	.00	.20	1.4	.51	.05	.15	.08	.10
7	.18	.15	.13	.00	.00	.15	1.2	.47	.04	.16	.06	.09
8	.18	.15	.12	.00	.00	.12	.95	1.1	.04	.12	.04	.09
9	.17	.15	.12	.00	.00	.10	.78	.88	.04	.09	.05	.10
10	.17	.18	.12	.00	.00	.12	.66	.81	.04	.08	.05	.09
11	.17	.19	.12	.00	.00	.10	.61	.81	.04	.07	.05	.07
12	.18	.19	.11	.00	.00	.08	.48	.68	.07	.08	.05	.10
13	.19	.20	.10	.00	.00	.06	.39	.50	.08	.08	.06	.10
14	.18	.21	.09	.00	.00	.05	.28	.41	.80	.06	.09	.09
15	.18	.24	.08	.00	.00	.04	.27	.34	.31	.05	.08	.09
16	.18	.22	.07	.00	.00	.05	.25	.29	.28	.06	.08	.08
17	.19	.21	.06	.00	.00	.08	.22	.25	.24	.06	.07	.08
18	.19	.21	.05	.00	.00	.15	.20	.22	.21	.09	.07	.25
19	.19	.21	.05	.00	.00	.40	.24	.20	.22	.10	.07	.15
20	.18	.20	.05	.00	.00	1.0	.23	.22	.19	.09	.07	.12
21	.17	.19	.04	.00	.00	4.0	.27	.20	.22	.09	.06	.10
22	.16	.19	.03	.00	.00	5.9	.25	.18	.17	.07	.06	.09
23	.13	.19	.03	.00	.00	6.1	.24	.15	.15	.07	.06	.08
24	.14	.19	.02	.00	.00	5.7	.17	.12	.15	.08	.05	.07
25	.13	.19	.02	.00	.00	3.2	.17	.15	.16	.07	.05	.08
26	.16	.18	.02	.00	.00	2.7	.18	.50	.21	.08	.05	.08
27	.15	.18	.01	.00	.01	2.7	.21	.60	.18	.08	.07	.09
28	.15	.17	.01	.00	.02	1.6	.31	.45	.17	.10	.07	.12
29	.16	.15	.01	.00	.03	1.4	.29	.35	.14	.13	.07	.14
30	.16	.15	.00	.00	---	1.2	.23	.28	1.2	.09	.07	.12
31	.16	---	.00	.00	---	1.2	---	.24	---	.09	.07	---
TOTAL	5.46	5.37	2.30	0.00	0.06	39.07	17.28	14.15	6.08	3.60	2.31	3.00
MEAN	.18	.18	.074	.00	.002	1.26	.58	.46	.20	.12	.075	.10
MAX	.22	.24	.15	.00	.03	6.1	1.4	1.1	1.2	.43	.15	.25
MIN	.13	.14	.00	.00	.00	.04	.17	.12	.04	.05	.04	.07
AC-FT	11	11	4.6	.0	.1	77	34	28	12	7.1	4.6	6.0

CAL YR 1987 TOTAL 1474.96 MEAN 4.04 MAX 275 MIN .00 AC-FT 2930
WTR YR 1988 TOTAL 98.68 MEAN .27 MAX 6.1 MIN .00 AC-FT 196

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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												
20...	1040	0.17	2880	8.50	1.0	2.5	22	12.5	99	K80	K60	170
NOV												
24...	1230	0.20	2930	8.43	5.0	1.5	21	12.5	95	--	--	190
MAR												
09...	1010	0.07	2650	8.31	7.5	0.5	36	12.3	94	K50	K60	200
22...	1120	4.8	2120	8.42	5.5	1.0	--	12.5	96	--	--	--
APR												
20...	0930	0.23	2600	8.39	2.0	6.5	16	11.2	99	K140	K55	200
JUN												
02...	0940	0.21	3100	8.52	24.5	20.5	28	8.4	102	--	--	150
JUL												
11...	1045	0.07	3180	9.07	21.5	22.0	--	8.0	100	--	--	--
SEP												
06...	1015	0.11	3320	8.99	21.5	15.5	43	9.0	99	60	50	160

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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												
20...	26	25	670	89	23	5.6	820	903	48	690	2.8	0.40
NOV												
24...	35	26	570	86	18	5.1	--	--	--	740	3.3	0.40
MAR												
09...	37	25	530	85	17	11	558	608	36	830	6.6	0.40
APR												
20...	37	25	610	87	19	5.2	710	793	36	700	6.3	0.40
JUN												
02...	18	26	710	91	25	6.6	400	415	--	850	180	0.50
JUL												
11...	--	--	--	--	--	--	1000	805	204	--	--	--
SEP												
06...	13	30	830	92	29	6.9	1030	--	144	920	2.9	0.40

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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
OCT												
20...	8.1	1940	1910	2.64	0.89	<0.010	<0.100	0.010	<0.010	--	0.60	0.030
NOV												
24...	13	2030	1890	2.76	1.10	<0.010	<0.100	0.020	0.010	0.01	--	0.020
MAR												
09...	13	1870	1780	2.54	0.35	0.040	0.140	0.080	0.090	0.12	1.4	0.110
APR												
20...	8.9	1780	1810	2.42	1.11	<0.010	<0.100	0.040	0.030	0.04	0.80	0.060
JUN												
02...	5.4	2160	2030	2.94	1.22	<0.010	<0.100	0.070	0.050	0.06	1.0	0.060
SEP												
06...	2.8	2340	2410	3.18	0.69	<0.010	<0.100	<0.010	0.030	0.04	0.80	0.030

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 20...	<0.010	<0.010	10	1	<100	<10	<1	3	<1	2	50
NOV 24...	<0.010	0.010	--	--	--	--	--	--	--	--	--
MAR 09...	0.050	0.030	20	1	<100	<10	<1	<1	1	3	100
APR 20...	0.010	<0.010	<10	1	<100	<10	<1	<1	<1	3	40
JUN 02...	0.020	<0.010	--	--	--	--	--	--	--	--	--
SEP 06...	0.020	0.010	80	3	<100	<10	1	<1	<1	2	20

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 20...	<5	80	30	0.1	1	2	<1	<1.0	370	3	30
MAR 09...	<5	60	200	<0.1	2	7	<1	<1.0	500	4	<10
APR 20...	<5	<10	30	<0.1	<1	2	<1	<1.0	400	4	<10
SEP 06...	<5	90	<10	<0.1	3	4	<1	<1.0	200	5	<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 20...	--	--	--	--	--	--	--	--	60	0.03	98
NOV 24...	--	--	--	--	--	--	--	--	104	0.06	89
MAR 09...	--	--	--	--	--	--	--	--	76	0.01	94
22...	1.4	5.3	13	7.6	8.0	6.9	0.07	1.7	--	--	--
APR 20...	--	--	--	--	--	--	--	--	97	0.06	94
JUN 02...	--	--	--	--	--	--	--	--	61	0.03	98
SEP 06...	--	--	--	--	--	--	--	--	62	0.02	97

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT								
20...	1040	--	--	2.5	2880	8.50	12.5	99
20...	1042	--	0.0	--	--	--	--	--
20...	1044	--	0.35	2.5	2880	8.50	12.5	98
20...	1045	--	--	2.5	2880	8.50	12.5	99
20...	1046	--	0.32	2.5	2880	8.50	12.5	98
20...	1048	--	0.30	2.5	2880	8.50	12.5	98
20...	1050	--	0.0	--	--	--	--	--
MAR								
09...	1010	--	--	0.5	2650	8.31	12.3	94
09...	1011	--	0.0	--	--	--	--	--
09...	1013	--	0.19	0.5	2650	8.31	12.3	93
09...	1015	--	0.34	0.5	2650	8.31	12.3	93
09...	1017	--	0.16	0.5	2650	8.31	12.3	93
09...	1018	--	0.0	--	--	--	--	--
APR								
20...	0930	0.60	0.0	6.5	2600	8.39	11.2	99
20...	0932	0.90	0.37	6.5	2600	8.39	11.2	98
20...	0934	1.20	0.39	6.5	2600	8.39	11.2	98
20...	0936	1.50	0.38	6.5	2600	8.39	11.2	98
20...	0938	1.80	0.32	6.5	2600	8.39	11.2	98
20...	0940	2.00	0.0	--	--	--	--	--
SEP								
06...	1015	--	--	15.5	3320	8.99	9.0	99
06...	1020	0.30	0.0	--	--	--	--	--
06...	1022	0.50	0.31	15.5	3320	8.99	9.0	98
06...	1024	0.70	0.39	15.5	3320	8.99	9.0	98
06...	1026	0.90	0.42	15.5	3320	8.99	9.0	98
06...	1028	1.10	0.40	15.5	3320	8.99	9.0	98
06...	1030	1.30	0.0	--	--	--	--	--

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 mi^2, 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: Oct. 1 to Mar. 30. Records poor. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--50 years, 323 ft^3/s, 234,000 acre-ft/yr; median of yearly mean discharges, 260 ft^3/s, 188,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,000 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 1	----	ice jam	*[a]3.99	July 6	----	*[b]500	unknown

No flow Jan. 3 to Feb. 20, July 30 to Aug. 7, 18 to Sept. 10.
a - Observed
b - About

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	20	22	1.0	.00	175	107	25	32	.04	.00	.00
2	22	20	12	.50	.00	130	104	25	35	.02	.00	.00
3	21	21	13	.00	.00	100	91	27	22	.02	.00	.00
4	20	22	14	.00	.00	70	83	36	14	.05	.0	.00
5	19	21	11	.00	.00	50	76	36	8.0	53	.00	.00
6	18	21	15	.00	.00	60	73	32	4.1	115	.00	.00
7	19	21	9.5	.00	.00	50	68	30	1.9	318	.00	.00
8	20	20	22	.00	.00	35	62	46	1.1	89	.62	.00
9	21	20	31	.00	.00	50	59	78	.63	53	2.0	.00
10	21	21	33	.00	.00	70	56	82	.47	64	.87	.00
11	22	20	23	.00	.00	50	53	57	.31	38	.27	.02
12	23	20	16	.00	.00	40	51	45	.22	16	.19	.33
13	24	20	12	.00	.00	30	46	36	1.4	9.5	.60	.83
14	24	20	10	.00	.00	28	43	25	53	5.5	.26	.28
15	23	19	9.5	.00	.00	28	40	19	22	2.6	.11	3.5
16	24	20	8.5	.00	.00	32	39	19	9.6	1.5	.04	.94
17	24	20	8.0	.00	.00	32	38	15	8.4	.90	.02	.17
18	24	19	7.5	.00	.00	34	37	13	5.7	.78	.01	.24
19	24	16	7.5	.00	.00	36	36	14	3.1	.52	.00	.39
20	22	19	7.0	.00	.00	40	35	13	1.8	.32	.00	.27
21	22	16	6.5	.00	20	55	33	9.7	.81	.24	.00	.29
22	23	18	6.5	.00	35	50	31	7.9	.30	.13	.00	.24
23	22	19	6.0	.00	75	45	32	7.6	.21	.07	.00	.18
24	23	18	6.0	.00	40	55	36	6.7	.10	.04	.00	.13
25	23	13	5.0	.00	60	75	31	8.2	.04	.03	.00	.10
26	23	12	3.5	.00	70	85	30	6.3	.03	.01	.00	.09
27	23	14	3.0	.00	75	90	30	5.5	.03	.02	.00	.08
28	20	12	2.5	.00	125	80	29	5.9	.03	.02	.00	.23
29	20	14	2.5	.00	150	75	28	5.1	.04	.01	.00	.19
30	21	20	2.0	.00	---	125	29	8.5	.10	.00	.00	.13
31	20	---	1.5	.00	---	126	---	28	---	.00	.00	---
TOTAL	678	556	336.5	1.50	650.00	2001	1506	772.4	226.42	768.32	4.99	8.63
MEAN	21.9	18.5	10.9	.048	22.4	64.5	50.2	24.9	7.55	24.8	.16	.29
MAX	24	22	33	1.0	150	175	107	82	53	318	2.0	3.5
MIN	18	12	1.5	.00	.00	28	28	5.1	.03	.00	.00	.00
AC-FT	1340	1100	667	3.0	1290	3970	2990	1530	449	1520	9.9	17

CAL YR 1987 TOTAL 47994.5 MEAN 131 MAX 3610 MIN 1.5 AC-FT 95200
WTR YR 1988 TOTAL 7509.76 MEAN 20.5 MAX 318 MIN .00 AC-FT 14900

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
07...	1135	19	1810	--	15.0	7.0	--	--	--	--	--
NOV											
17...	1220	19	1980	--	6.0	0.5	--	--	--	--	--
DEC											
10...	1330	36	1880	--	13.0	0.5	--	--	--	--	--
MAR											
02...	1135	131	940	--	0.5	0.5	--	--	--	--	--
30...	1125	81	1340	8.40	2.5	3.0	260	58	28	220	64
APR											
13...	1315	45	1660	--	12.0	14.5	--	--	--	--	--
MAY											
11...	1505	56	1480	--	24.5	22.0	--	--	--	--	--
JUN											
03...	1345	21	2010	--	30.5	26.5	--	--	--	--	--
22...	1040	0.37	3300	8.90	32.0	26.5	190	31	27	670	88
AUG											
10...	1200	1.5	1030	--	33.0	25.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	6	7.9	280	470	9.5	0.30	5.8	974	968	214	1.32
JUN											
22...	22	15	520	1200	27	0.60	1.2	2230	2310	2.23	3.03

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)
MAR										
30...	1	210	60	<1	64	10	0.1	4	1	540
JUN										
22...	2	420	50	<1	150	10	1.1	7	<1	590

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 mi^2, 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. 31 and Apr. 17 to June 12. Records poor.

AVERAGE DISCHARGE.--6 years (water years 1978-83), 33.3 ft^3/s, 24,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/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, 85.0 ft^3/s, Feb. 28, gage height, 5.87 ft, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	26	8.2	2.0	1.2	.00	.00	.00
2					.00	22	8.2	1.9	1.2	.00	.00	.00
3					.00	19	8.3	1.8	1.1	.00	.00	.00
4					.00	17	8.2	1.8	1.0	.00	.00	.00
5					.00	18	7.5	1.7	.95	.00	.00	.00
6					.00	26	6.8	1.6	.82	.00	.00	.00
7					.00	24	6.9	1.6	.70	.00	.00	.00
8					.00	21	7.2	1.7	.60	.00	.00	.00
9					.00	22	6.7	1.7	.45	.00	.00	.00
10					.00	26	6.4	2.0	.32	.00	.00	.00
11					.00	32	5.9	2.4	.22	.00	.00	.00
12					.00	25	5.5	2.3	.12	.00	.00	.00
13					.00	20	5.5	2.1	.05	.00	.00	.00
14					.00	16	5.1	2.0	.10	.00	.00	.00
15					.00	12	4.7	1.9	.10	.00	.00	.00
16					.00	9.5	4.4	1.8	.05	.00	.00	.00
17					.00	9.0	4.2	1.7	.02	.00	.00	.00
18					.05	9.5	3.8	1.8	.00	.00	.00	.00
19					.50	10	4.0	1.9	.00	.00	.00	.00
20					1.0	11	3.8	1.8	.00	.00	.00	.00
21					6.0	12	3.5	1.7	.00	.00	.00	.00
22					14	13	3.2	1.7	.00	.00	.00	.00
23					20	15	3.0	1.6	.00	.00	.00	.00
24					28	18	2.8	1.5	.00	.00	.00	.00
25					25	16	2.6	1.4	.00	.00	.00	.00
26					22	20	2.4	1.3	.00	.00	.00	.00
27					40	18	2.5	1.3	.00	.00	.00	.00
28					55	16	2.6	1.4	.00	.00	.00	.00
29					30	13	2.4	1.5	.00	.00	.00	.00
30					---	11	2.2	1.4	.00	.00	.00	.00
31					---	9.0	---	1.3	---	.00	.00	---
TOTAL					241.55	536.0	148.5	53.6	9.00	0.00	0.00	0.00
MEAN					8.33	17.3	4.95	1.73	.30	.00	.00	.00
MAX					55	32	8.3	2.4	1.2	.00	.00	.00
MIN					.00	9.0	2.2	1.3	.00	.00	.00	.00
AC-FT					479	1060	295	106	18	.0	.0	.0

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
FEB											
29...	1310	32	950	7.93	10.0	0.5	250	46	32	110	48
MAR											
14...	1425	17	1970	--	4.0	0.5	--	--	--	--	--
29...	1000	14	1820	--	-0.5	0.5	--	--	--	--	--
APR											
11...	1225	6.2	2260	--	22.0	9.5	--	--	--	--	--
MAY											
16...	1310	1.9	2540	--	27.5	11.5	--	--	--	--	--
JUN											
13...	1130	0.04	2800	8.72	29.0	24.5	560	44	110	500	65

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
29...	3	13	160	330	7.7	0.10	6.6	662	643	57.6	0.90
JUN											
13...	9	12	350	1200	13	0.30	1.2	2140	2110	0.23	2.91

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)
FEB										
29...	1	200	80	<1	17	70	<0.1	1	<1	460
JUN										
13...	2	640	40	<1	80	60	<1.0	20	<1	820

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 mi^2 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: Oct. 5, 6, Nov. 17-19, 29 to Mar. 19. Records fair except for periods Nov. 15 to Jan. 14 and Feb. 19 to Mar. 19, which are poor.

AVERAGE DISCHARGE.--54 years, 573 ft^3/s, 415,100 acre-ft/yr; median of yearly mean discharges, 460 ft^3/s, 333,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 110,000 ft^3/s, Mar. 25, 1947, gage height, 24.0 ft from flood-mark, site then in use; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Feb. 29	----	ice jam	*3.63	Mar. 24	1515	*400	2.18

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	21	15	.05	.00	220	156	34	13	122	.16	.00
2	44	24	12	.00	.00	170	143	49	12	67	.32	.00
3	43	23	13	.00	.00	160	142	51	11	38	.24	.00
4	40	24	14	.00	.00	150	150	42	7.9	42	.00	.00
5	37	24	14	.00	.00	140	145	38	5.7	30	.00	.00
6	36	20	14	.00	.00	140	157	38	5.1	28	.00	.00
7	33	22	14	.00	.00	130	143	40	8.3	35	.00	.00
8	32	24	14	.00	.00	140	135	84	9.4	24	.00	.00
9	32	23	14	.00	.00	160	129	105	7.8	24	.00	.00
10	30	24	14	.00	.00	180	119	96	6.0	53	.00	.00
11	28	24	13	.00	.00	170	111	88	4.5	21	.00	.00
12	27	24	13	.00	.00	150	103	86	2.9	15	.00	.00
13	25	25	12	.00	.00	130	97	88	3.1	32	.00	.00
14	25	25	12	.00	.00	90	92	75	11	50	.00	.00
15	24	25	10	.00	.00	70	88	58	23	31	.00	.00
16	25	28	8.0	.00	.00	80	84	56	16	22	.00	.00
17	24	28	6.0	.00	.00	90	80	69	12	18	.00	.00
18	25	23	5.0	.00	.00	200	75	62	7.5	18	.00	2.1
19	23	25	5.0	.00	.00	260	71	57	3.4	15	.00	40
20	19	27	4.5	.00	.00	276	69	53	2.0	8.7	.00	16
21	30	24	4.0	.00	.00	292	63	47	2.0	5.5	.00	9.8
22	22	33	3.5	.00	.50	330	60	41	5.5	3.9	.00	5.1
23	19	21	3.0	.00	2.0	317	57	37	11	3.3	.00	2.9
24	14	31	2.0	.00	1.0	367	54	34	18	2.9	.00	2.4
25	16	27	1.5	.00	.05	314	51	31	14	2.5	.00	2.6
26	20	30	1.2	.00	.00	295	47	28	8.9	1.9	.00	2.6
27	22	28	1.0	.00	.20	274	43	23	5.3	1.5	.00	2.2
28	23	25	.70	.00	15	239	40	20	3.2	1.2	.00	2.0
29	23	22	.50	.00	300	219	36	24	2.6	.91	.00	2.0
30	22	17	.25	.00	---	191	34	17	202	.70	.00	2.2
31	22	---	.10	.00	---	185	---	14	---	.55	.00	---
TOTAL	850	741	244.25	0.05	318.75	6129	2774	1585	444.1	718.56	0.72	91.90
MEAN	27.4	24.7	7.88	.002	11.0	198	92.5	51.1	14.8	23.2	.023	3.06
MAX	45	33	15	.05	300	367	157	105	202	122	.32	40
MIN	14	17	.10	.00	.00	70	34	14	2.0	.55	.00	.00
AC-FT	1690	1470	484	.1	632	12160	5500	3140	881	1430	1.4	182

CAL YR 1987 TOTAL 116637.25 MEAN 320 MAX 5520 MIN .10 AC-FT 231300
WTR YR 1988 TOTAL 13897.33 MEAN 38.0 MAX 367 MIN .00 AC-FT 27570

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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											
21...	1030	20	2280	8.48	2.0	0.5	38	13.2	100	60	50
NOV											
25...	1125	32	2400	8.50	-2.5	0.5	--	13.0	--	--	--
MAR											
23...	1230	307	1760	8.29	8.0	1.0	530	12.5	97	--	--
APR											
21...	1010	65	2260	8.58	5.0	9.0	21	10.8	102	--	--
JUN											
02...	1300	12	2780	8.50	24.5	23.5	--	8.0	102	--	--
JUL											
11...	1330	22	1840	8.63	23.5	23.0	--	7.8	99	--	--

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
OCT										
21...	360	71	43	370	69	9	9.0	364	405	19
MAR										
23...	280	56	33	300	70	8	7.6	249	304	0
APR										
21...	370	76	44	400	69	9	8.8	336	371	19
JUN										
02...	--	--	--	--	--	--	--	830	915	48
JUL										
11...	--	--	--	--	--	--	--	330	354	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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT										
21...	750	11	0.40	13	1550	1480	2.11	83.3	<0.010	<0.100
MAR										
23...	660	12	0.20	6.8	1230	1240	1.67	1020	<0.010	0.370
APR										
21...	840	36	0.40	7.8	1570	1610	2.14	275	<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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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										
21...	0.020	0.020	0.03	0.70	0.020	<0.010	<0.010	20	1	100
MAR										
23...	0.060	0.130	0.17	<0.20	0.040	0.020	0.050	50	<1	41
APR										
21...	0.030	0.020	0.03	0.40	0.030	<0.010	<0.010	<10	1	100

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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										
21...	<10	<1	2	3	3	20	<5	80	20	0.1
MAR										
23...	<0.5	<1	<1	<3	4	36	<5	60	9	<0.1
APR										
21...	<10	<1	<1	2	3	20	<5	80	<10	<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 (70331)
OCT										
21...	4	5	<1	<1.0	870	2	10	220	12	98
MAR										
23...	<10	1	1	<1.0	520	<6	27	1350	1120	98
APR										
21...	3	1	<1	<1.0	800	2	<10	124	22	97

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT								
21...	1030	--	0.0	0.5	2280	8.48	13.2	100
21...	1032	--	0.47	0.5	2280	8.50	13.2	98
21...	1034	--	0.78	0.5	2280	--	13.2	98
21...	1036	--	0.70	0.5	2280	8.50	13.2	98
21...	1038	--	0.69	0.5	2280	8.50	13.2	98
21...	1040	--	0.69	0.5	2280	8.50	13.2	--
21...	1042	--	0.71	0.5	2280	8.50	13.2	98
21...	1044	--	--	0.5	2280	8.50	13.2	98
21...	1046	--	0.90	0.5	2280	8.50	13.2	98
21...	1048	--	0.86	0.5	2280	8.50	13.2	98
21...	1050	--	0.74	0.5	2280	8.50	13.2	98
21...	1052	--	0.39	0.5	2280	8.50	13.2	98
MAR								
23...	1230	--	--	1.0	1760	8.29	12.5	97
23...	1231	8.00	1.7	1.0	1760	8.28	12.5	--
23...	1232	16.0	1.2	1.0	1760	8.29	12.5	--
23...	1234	24.0	0.30	1.0	1750	8.27	12.4	--
23...	1238	14.0	0.88	1.0	--	8.27	12.4	--
23...	1239	22.0	1.5	1.0	1760	8.29	12.5	--
23...	1240	30.0	1.8	1.0	1760	8.29	12.5	--
23...	1241	38.0	2.2	1.0	1760	8.28	12.6	--
23...	1242	46.0	2.3	1.0	1760	8.28	12.6	--
23...	1243	54.0	2.0	1.0	1760	8.29	12.6	--
23...	1244	62.0	1.6	1.0	1760	8.29	12.5	--
23...	1246	70.0	1.2	1.0	1760	8.29	12.5	--
23...	1247	78.0	1.3	1.0	1760	8.29	12.5	--
23...	1248	86.0	1.2	1.0	1750	8.28	12.5	--
23...	1250	94.0	0.50	1.0	1750	8.27	12.4	--
23...	1253	8.00	1.0	1.0	1750	8.28	12.5	--
23...	1254	16.0	1.3	1.0	1750	8.28	12.5	--
23...	1256	24.0	1.4	1.0	1750	8.29	12.5	--
23...	1258	32.0	1.7	1.0	1760	8.29	12.5	--
APR								
21...	0930	0.0	0.0	--	--	--	--	--
21...	0932	6.00	1.5	9.0	2260	8.58	10.8	101
21...	0934	12.0	1.3	9.0	2260	8.58	10.8	101
21...	0936	18.0	1.0	9.0	2260	8.58	10.8	101
21...	0938	24.0	0.87	9.0	2260	8.58	10.8	101
21...	0940	30.0	0.70	9.0	2260	8.58	10.8	101
21...	0942	36.0	0.78	9.0	2260	8.58	10.8	101
21...	0944	42.0	0.82	9.0	2260	8.58	10.8	101
21...	0946	48.0	0.85	9.0	2260	8.58	10.8	101
21...	0948	54.0	0.75	9.0	2260	8.58	10.8	101
21...	0950	60.0	0.68	9.0	2260	8.58	10.8	101
21...	0952	66.0	0.70	9.0	2260	8.58	10.8	101
21...	0954	72.0	0.70	9.0	2260	8.58	10.8	101
21...	0956	78.0	0.60	9.0	2260	8.58	10.8	101
21...	0958	84.0	0.38	9.0	2250	8.57	10.8	101
21...	1000	90.0	0.18	9.0	2250	8.56	10.8	101
21...	1010	92.0	0.0	9.0	2260	8.58	10.8	102

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 mi^2, 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, 14,742,000 acre-ft Mar. 13, 1978, elevation, 1,825.2 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 19,346,000 acre-ft, Oct. 4, elevation, 1,841.1 ft; minimum, 14,832,000 acre-ft, Sept. 27, elevation, 1,825.7 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1840.5	19,152,000	--
Oct. 31	1839.7	18,896,000	-256,000
Nov. 30	1839.1	18,705,000	-191,000
Dec. 31	1837.3	18,148,000	-557,000
CAL YR 1987	-	-	-1,996,000
Jan. 31	1835.2	17,514,000	-634,000
Feb. 29	1833.0	16,868,000	-646,000
Mar. 31	1832.7	16,782,000	-86,000
Apr. 30	1831.0	16,296,000	-486,000
May 31	1831.2	16,353,000	+57,000
June 30	1832.2	16,638,000	+285,000
July 31	1830.2	16,071,000	-567,000
Aug. 31	1827.4	15,293,000	-778,000
Sept. 30	1825.9	14,885,000	-408,000
WTR YR 1988	-	-	-4,267,000

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.--19 years, 23,880 ft^3/s, 17,300,000 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, 27,500 ft^3/s, Feb. 12; minimum daily, 10,200 ft^3/s, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16000	11800	20300	20300	24900	21400	19000	17400	18800	19100	17800	18300
2	15700	12700	20300	17600	25200	21000	19100	17200	18700	19200	17500	18100
3	16100	12400	19800	17900	25700	21000	19900	17300	18800	19000	17900	18000
4	16000	12300	19900	19500	26500	21500	19100	17300	19300	19100	18000	18000
5	16200	12300	20300	20600	26900	19300	19000	17400	19300	19100	18000	17800
6	14200	12300	19800	21200	26300	19100	19300	17300	19200	19300	17900	16800
7	12200	11900	20200	21300	26900	19200	19300	17600	19100	19200	17700	16100
8	12800	11900	19600	21400	26700	19300	19000	17600	19100	19400	18100	14900
9	12400	12200	20500	21000	27300	19400	17500	17700	18900	19300	18300	14800
10	12800	11800	20200	19500	27100	19400	17600	18500	19100	19200	18200	14800
11	12500	12400	19700	20100	27200	18600	18000	18400	19200	19400	18200	14400
12	12500	12300	19900	20400	27500	18800	18200	20000	19000	19200	17600	14700
13	12500	12700	20000	20600	27000	19000	18400	20100	19000	19400	18000	14600
14	12500	11500	20200	20500	26300	19200	18400	18800	19200	19400	18100	14800
15	12600	10900	21000	20800	26900	19400	18400	18900	18900	19300	18300	15100
16	12600	11800	20100	20800	27000	18800	18000	19400	19200	19000	18000	15200
17	12500	12000	20200	19800	26300	18600	17700	19100	19300	19200	18000	13500
18	12000	11700	19700	20500	26400	19000	17800	19400	19000	18900	18000	12200
19	12700	12000	20300	21100	26300	18600	18000	17500	19000	19300	18100	12200
20	12500	12000	20200	21100	27100	18700	18100	19200	19200	19300	17900	12100
21	12700	12000	20200	21500	26700	18900	18000	19200	19500	19300	17600	11200
22	12600	11800	20200	22400	26900	19300	18100	19300	19200	19400	18100	10500
23	12300	12000	19300	23000	26300	19100	17700	19400	19400	19300	18100	10700
24	12200	12300	20200	23300	26500	18900	17900	19100	19000	19200	18300	10300
25	11600	14900	19700	23400	26700	19100	18300	19600	19100	19400	18500	10600
26	11700	16300	20300	23800	26600	19400	17700	19200	19200	19500	18300	10400
27	12100	16100	20100	23100	24400	19500	17800	19000	18800	19600	18000	10400
28	12100	16000	19700	23000	21000	19100	17900	19100	19100	19000	17600	10400
29	12400	15800	20600	24200	20800	19000	18100	19300	19100	18900	18300	10500
30	12500	17900	19500	24000	---	18800	17700	19200	19100	17800	18300	10200
31	12800	---	20100	24100	---	19700	---	19300	---	17700	18500	---
TOTAL	404300	386000	622100	661800	757400	600100	549000	577800	572800	593400	559200	411600
MEAN	13040	12870	20070	21350	26120	19360	18300	18640	19090	19140	18040	13720
MAX	16200	17900	21000	24200	27500	21500	19900	20100	19500	19600	18500	18300
MIN	11600	10900	19300	17600	20800	18600	17500	17200	18700	17700	17500	10200

CAL YR 1987 TOTAL 6368400 MEAN 17450 MAX 28300 MIN 9600
WTR YR 1988 TOTAL 6695500 MEAN 18290 MAX 27500 MIN 10200

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.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1971 to current year.
WATER TEMPERATURES: October 1971 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum observed, 870 microsiemens, May 4, 18, 19, July 4, 1980; minimum observed, 500 microsiemens, Mar. 20, 1986.
WATER TEMPERATURES: Maximum observed, 24.4°C, Aug. 13, 1988; minimum observed, 0.0°C on many days during winter months in most years.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum observed, 790 microsiemens, Mar. 22; minimum observed, 595 microsiemens, Dec. 4.

WATER TEMPERATURES: Maximum observed, 24.4°C, Aug. 13; minimum observed, 3.4°C, Dec. 31.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (FTU) (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)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
OCT												
07...	0850	620	8.64	8.0	15.5	--	8.2	82	--	--	--	--
NOV												
25...	1130	695	8.48	0.0	8.5	0.40	10.3	88	1	7	220	53
JAN												
12...	0950	700	8.48	-7.0	3.0	0.70	12.4	92	<1	<1	220	52
FEB												
24...	0925	700	8.37	-2.0	13.5	0.70	10.6	101	20	6	230	55
APR												
13...	0905	690	8.44	10.0	4.0	0.60	11.8	90	<1	<1	230	54
JUN												
01...	0845	710	8.47	20.0	10.0	0.50	10.1	90	<1	<1	230	54
JUL												
06...	0900	730	8.32	22.0	11.5	--	9.0	83	--	--	--	--
AUG												
17...	0915	680	8.18	20.5	11.5	0.70	6.8	62	4	8	250	60

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 WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICARBONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CARBONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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)
OCT												
07...	--	--	--	--	--	145	171	3	--	--	--	--
NOV												
25...	21	63	38	2	4.1	88	76	16	180	13	0.60	6.7
JAN												
12...	21	62	38	2	4.4	260	214	51	180	10	0.50	6.6
FEB												
24...	22	66	38	2	4.5	191	199	17	190	11	0.50	7.0
APR												
13...	22	67	39	2	4.1	178	209	4	190	10	0.50	6.9
JUN												
01...	23	68	39	2	3.8	224	270	1	190	12	0.60	6.7
JUL												
06...	--	--	--	--	--	175	194	10	--	--	--	--
AUG												
17...	24	68	37	2	4.4	180	220	0	190	11	0.50	7.0

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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, 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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)
NOV 25...	443	395	0.60	0.0	<0.010	<0.100	0.020	0.090	0.12	<0.20	0.010
JAN 12...	446	498	0.61	0.0	<0.010	<0.100	0.010	0.070	0.09	0.20	0.010
FEB 24...	461	472	0.63	0.0	<0.010	<0.100	0.030	0.020	0.03	0.30	0.010
APR 13...	458	462	0.62	0.0	<0.010	<0.100	0.030	0.030	0.04	0.70	0.070
JUN 01...	463	492	0.63	0.0	<0.010	0.170	0.010	0.090	0.12	0.60	<0.010
AUG 17...	485	472	0.66	0.0	<0.010	0.120	<0.010	<0.010	--	0.30	0.060

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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 25...	<0.010	<0.010	<10	2	46	<0.5	<1	<1	<3	12	3
JAN 12...	0.010	<0.010	--	--	--	--	--	--	--	--	--
FEB 24...	<0.010	<0.010	<10	2	80	<0.5	<1	<1	<3	9	10
APR 13...	0.020	0.010	<10	2	48	<0.5	<1	<1	<3	6	4
JUN 01...	0.020	0.020	--	--	--	--	--	--	--	--	--
AUG 17...	0.060	0.060	<10	2	53	<0.5	<1	<1	<3	6	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 25...	<5	45	1	<0.1	<10	3	<1	<1.0	510	<6	13
FEB 24...	<5	50	4	<0.1	<10	1	1	1.0	530	<6	17
APR 13...	<5	46	<1	0.2	<10	<1	1	<1.0	540	<6	5
AUG 17...	<5	50	2	<0.1	<10	3	1	1.0	580	<6	15

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988, ONCE DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.9	11.9	8.3	3.5	15.5	17.1	13.0	18.2	20.1	19.6	22.0	20.0
2	16.6	11.1	8.1	3.3	15.3	16.4	11.1	19.0	19.2	19.4	21.2	19.9
3	12.8	11.3	8.0	3.3	15.0	16.8	15.0	17.6	19.2	19.6	22.4	20.3
4	12.7	11.2	8.4	1.8	15.4	17.4	14.5	18.2	19.1	20.6	20.6	20.1
5	13.0	11.1	8.1	1.8	13.8	17.2	17.9	17.3	19.5	20.7	20.8	19.1
6	16.2	11.3	8.0	1.2	13.6	17.2	16.9	13.2	20.8	21.2	21.5	19.0
7	16.2	10.8	7.9	1.2	13.2	17.0	18.1	19.1	21.0	20.8	21.0	19.6
8	16.0	10.7	7.7	1.5	14.8	17.0	18.5	18.4	21.2	21.0	20.9	19.7
9	15.2	10.7	6.8	1.5	14.3	16.5	15.3	16.5	21.1	20.0	20.3	19.4
10	15.2	10.9	7.4	1.4	13.0	15.5	15.7	17.4	20.6	20.3	20.9	19.2
11	15.3	10.9	7.3	1.6	12.7	16.9	16.6	15.0	20.6	20.0	21.7	19.0
12	15.2	10.4	7.1	2.0	14.3	15.3	16.2	15.5	20.8	20.2	21.3	18.4
13	14.8	10.3	7.2	1.6	13.4	15.4	16.0	19.5	19.1	19.9	24.4	21.2
14	14.7	10.1	6.2	1.7	14.3	15.4	16.9	19.1	18.9	20.0	21.0	19.6
15	14.5	10.1	6.1	1.8	15.6	14.8	13.0	19.0	17.6	21.0	22.2	20.1
16	14.5	10.0	6.9	1.8	16.3	15.1	11.0	19.4	17.6	20.3	22.3	18.0
17	14.6	9.7	5.8	1.6	15.6	15.3	18.2	18.5	19.0	20.2	22.1	20.0
18	14.7	9.5	6.2	1.8	15.3	15.3	15.3	19.0	19.8	20.2	22.0	20.0
19	13.9	9.4	5.6	1.8	15.0	14.0	12.6	20.3	20.1	20.0	21.9	18.6
20	13.5	8.9	5.3	1.4	15.4	17.0	17.0	20.0	19.6	19.3	21.8	18.4
21	13.0	9.2	5.2	2.6	16.5	12.8	17.2	19.0	20.5	20.3	22.3	18.4
22	12.9	9.5	5.6	1.6	16.8	16.0	15.0	19.7	19.9	19.4	21.5	18.5
23	12.6	8.5	5.2	1.7	16.2	17.1	15.7	18.8	20.2	21.7	21.0	18.0
24	12.1	8.5	5.2	1.7	15.9	17.7	15.3	19.1	21.0	20.8	21.6	18.6
25	12.4	8.4	5.0	1.5	15.9	17.6	15.1	19.4	20.8	20.7	21.5	18.6
26	12.1	8.3	4.2	1.7	16.6	9.7	17.7	19.9	20.9	21.4	20.5	18.6
27	12.1	8.3	4.3	1.9	16.9	17.6	16.3	19.9	21.0	21.8	20.1	18.6
28	12.1	8.5	4.0	1.7	17.0	17.7	15.3	19.8	21.5	22.3	19.2	17.9
29	11.9	8.4	4.1	---	17.1	16.7	18.6	20.0	19.5	21.4	19.1	17.9
30	12.0	8.0	4.0	---	---	17.9	17.4	20.2	20.0	21.1	19.5	17.5
31	12.0	---	3.4	---	---	17.6	---	20.1	---	22.0	20.5	---
MEAN	13.9	9.9	6.2	---	15.2	16.2	15.7	18.6	20.0	20.6	21.3	19.1
MAX	16.6	11.9	8.4	---	17.1	17.9	18.6	20.3	21.5	22.3	24.4	21.2
MIN	11.9	8.0	3.4	---	12.7	9.7	11.0	13.2	17.6	19.3	19.1	17.5

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988, ONCE DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	650	650	635	695	700	725	720	730	720	730	750	730
2	670	655	645	700	720	735	650	740	715	725	760	735
3	650	650	600	695	720	715	750	710	700	730	750	735
4	650	650	595	685	740	730	720	720	700	660	750	730
5	630	650	640	690	715	720	720	725	710	630	730	735
6	650	650	640	690	710	720	730	710	700	740	730	740
7	630	690	640	695	710	735	735	700	690	740	720	755
8	645	675	640	690	710	725	740	715	700	740	715	760
9	620	670	640	675	710	735	715	715	715	710	720	750
10	650	680	630	680	710	725	740	710	640	700	710	755
11	600	670	630	700	705	725	730	725	640	700	730	750
12	650	720	620	695	705	740	700	725	630	710	745	760
13	655	700	630	700	710	730	720	730	720	720	730	755
14	650	655	630	690	710	740	725	740	720	710	760	750
15	650	650	660	695	710	765	720	710	720	740	755	745
16	655	630	660	690	720	750	750	720	730	730	770	755
17	650	655	660	690	700	730	740	735	710	740	765	765
18	650	655	660	675	700	740	720	740	730	740	770	730
19	655	620	720	680	700	760	730	770	740	745	730	690
20	650	660	690	675	715	750	720	750	770	735	750	745
21	650	670	740	660	710	765	710	740	750	740	760	740
22	655	620	700	680	709	790	715	750	740	720	750	730
23	655	640	700	675	710	770	720	735	737	740	740	725
24	650	650	700	675	715	735	720	730	725	750	760	740
25	650	650	710	675	725	745	720	735	735	730	755	730
26	650	650	710	675	735	770	730	750	740	740	750	730
27	650	640	690	680	720	730	720	725	720	750	778	735
28	650	640	690	680	725	725	720	730	725	780	735	735
29	650	650	700	---	735	755	725	740	700	750	735	730
30	650	640	690	---	---	740	720	750	730	760	730	760
31	650	---	695	---	---	730	---	700	---	750	740	---
MEAN	647	656	664	---	714	740	722	729	713	729	744	741
MAX	670	720	740	---	740	790	750	770	770	780	778	765
MIN	600	620	595	---	700	715	650	700	630	630	710	690

06339010 MISSOURI RIVER ABOVE STANTON, ND

LOCATION.--Lat 47°21'45", long 101°21'25", SE¼NE¼SE¼ 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.

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, 64.21 ft, May 7, 1987.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.35	64.94	---	---	---	66.78	66.29	66.09	66.33	66.24	66.11	66.12
2	65.35	65.26	---	---	---	66.65	66.18	66.06	66.31	66.27	66.10	65.97
3	65.26	65.32	---	---	---	66.83	66.31	66.00	66.05	66.26	66.09	66.11
4	65.43	64.92	---	---	---	66.69	66.26	65.99	66.23	66.24	66.13	66.07
5	65.55	65.28	---	---	---	66.54	66.17	65.98	66.34	66.29	66.14	65.98
6	65.43	65.12	---	---	---	66.23	66.27	66.00	66.34	66.27	66.17	66.03
7	65.14	65.18	---	---	---	66.14	66.30	66.06	66.34	66.28	66.06	65.66
8	65.07	64.99	---	---	---	66.32	66.21	65.95	66.22	66.32	66.14	65.42
9	65.02	65.21	---	---	---	66.35	65.94	66.09	66.32	66.30	65.97	65.33
10	65.19	65.17	---	---	---	66.31	65.94	66.19	66.29	66.29	66.37	65.36
11	65.11	65.09	---	---	---	66.18	65.81	66.17	66.40	66.33	66.13	65.28
12	64.88	65.14	---	---	---	66.21	66.04	66.40	66.21	66.33	66.03	65.31
13	65.11	65.39	---	---	---	66.24	66.06	66.44	66.33	66.33	66.08	65.32
14	64.97	64.97	---	---	---	66.36	66.12	66.09	66.18	66.37	66.15	65.49
15	65.11	64.88	---	---	---	66.05	66.18	66.19	66.23	66.35	66.05	65.29
16	65.16	64.92	---	---	---	66.26	66.06	66.35	66.23	66.28	66.08	65.47
17	65.05	65.13	---	---	---	66.29	66.10	66.42	66.29	66.32	66.08	65.09
18	65.07	65.16	---	---	---	66.02	65.91	66.35	66.28	66.27	66.06	64.86
19	64.94	65.05	---	---	---	66.20	66.01	66.13	66.31	66.37	66.09	64.77
20	65.22	---	---	---	---	66.26	66.07	66.18	66.31	66.33	65.94	64.73
21	65.06	---	---	---	---	66.27	66.10	66.33	66.39	66.40	65.99	64.57
22	64.98	---	---	---	---	66.03	66.10	66.30	66.24	66.35	66.04	64.35
23	65.11	---	---	---	---	66.20	66.05	66.31	66.31	66.37	65.96	64.59
24	65.01	---	---	---	---	66.17	66.06	66.35	66.36	66.37	66.10	64.35
25	64.70	---	---	---	68.42	66.14	65.77	66.23	66.33	66.38	66.10	64.44
26	65.00	---	---	---	67.93	66.25	66.20	66.39	66.32	66.43	66.06	64.48
27	65.05	---	---	---	67.82	66.24	66.09	66.22	66.28	66.44	65.99	64.40
28	65.14	---	---	---	66.65	66.33	66.03	66.35	66.29	66.22	65.88	64.41
29	65.17	---	---	---	66.92	65.84	66.09	66.28	66.30	66.34	66.23	64.37
30	65.07	---	---	---	---	66.38	66.12	66.32	66.33	66.16	66.13	64.45
31	65.22	---	---	---	---	66.19	---	66.35	---	66.12	66.11	---
MEAN	65.13	---	---	---	---	66.29	66.09	66.21	66.29	66.31	66.08	65.14
MAX	65.55	---	---	---	---	66.83	66.31	66.44	66.40	66.44	66.37	66.12
MIN	64.70	---	---	---	---	65.84	65.77	65.95	66.05	66.12	65.88	64.35

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: Nov. 16 to Apr. 5 and July 25 to Aug. 8. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--21 years, 21.7 ft^3/s, 15,720 acre-ft/yr; median of yearly mean discharges, 24 ft^3/s, 17,400 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)
Feb. 29	----	*45.0	*ab5.95				

No flow for many days.
a - Backwater from ice
b - From flood mark

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.2	1.0	.08	.00	26	7.0	1.4	.56	.08	.00	.00
2	1.8	1.3	1.0	.06	.00	19	7.4	2.7	.46	.08	.00	.00
3	1.6	1.3	1.1	.04	.00	17	8.0	3.1	.44	.07	.00	.00
4	1.4	1.3	1.2	.02	.00	14	8.4	3.3	.38	.05	.00	.00
5	1.4	1.4	1.2	.00	.00	12	8.3	5.8	.32	.10	.00	.00
6	1.4	1.4	1.3	.00	.00	11	5.7	4.9	.21	.14	.00	.00
7	1.6	1.3	1.3	.00	.00	9.0	5.4	3.6	.19	.17	.00	.00
8	1.4	1.2	1.4	.00	.00	8.0	4.3	4.4	.19	.14	.00	.00
9	1.3	1.2	1.4	.00	.00	8.5	3.8	4.7	.22	.07	.00	.01
10	1.3	1.3	1.3	.00	.00	10	3.5	4.9	.20	.04	.00	.02
11	1.2	1.2	1.4	.00	.00	8.0	3.5	4.6	.15	.03	.00	.05
12	1.2	1.2	1.4	.00	.00	6.0	3.5	3.8	.11	.03	.00	.05
13	1.2	1.4	1.3	.00	.00	4.5	2.7	3.5	.10	.03	.00	.02
14	1.4	1.4	1.1	.00	.00	3.5	2.2	3.2	.20	.02	.00	.01
15	1.6	1.5	.85	.00	.00	2.5	2.1	2.6	.22	.01	.00	.02
16	1.6	1.5	.60	.00	.00	2.0	2.0	2.3	.18	.01	.00	.01
17	1.4	1.4	.45	.00	.02	2.2	1.7	1.9	.21	.01	.00	.01
18	1.3	1.3	.35	.00	.05	2.4	1.6	1.7	.29	.01	.00	.10
19	1.2	1.2	.36	.00	.15	2.6	1.5	1.6	.38	.01	.00	.16
20	1.5	1.2	.38	.00	.30	3.0	1.4	1.6	.34	.01	.00	.05
21	1.5	1.1	.40	.00	.70	4.5	1.3	1.4	.25	.01	.00	.01
22	1.5	1.1	.35	.00	1.2	6.0	1.3	1.5	.18	.01	.00	.00
23	1.5	1.2	.30	.00	2.5	7.0	1.2	1.4	.13	.00	.00	.00
24	1.3	1.4	.25	.00	2.0	8.0	1.1	1.3	.09	.00	.00	.00
25	1.3	1.5	.20	.00	5.0	7.5	1.1	1.3	.05	.00	.00	.00
26	1.5	1.4	.17	.00	12	7.0	1.2	1.4	.04	.00	.00	.00
27	1.4	1.4	.16	.00	20	7.5	1.2	1.2	.03	.00	.00	.00
28	1.3	1.3	.15	.00	30	6.8	1.1	1.1	.03	.00	.00	.00
29	1.3	1.2	.14	.00	35	6.2	.87	1.0	.02	.00	.00	.00
30	1.4	1.1	.13	.00	---	5.5	1.2	.81	.06	.00	.00	.00
31	1.2	---	.10	.00	---	4.7	---	.65	---	.00	.00	---
TOTAL	43.7	38.9	22.74	0.20	108.92	241.9	95.57	78.66	6.23	1.13	0.00	0.52
MEAN	1.41	1.30	.73	.006	3.76	7.80	3.19	2.54	.21	.036	.00	.017
MAX	1.8	1.5	1.4	.08	35	26	8.4	5.8	.56	.17	.00	.16
MIN	1.2	1.1	.10	.00	.00	2.0	.87	.65	.02	.00	.00	.00
AC-FT	87	77	45	.4	216	480	190	156	12	2.2	.0	1.0

CAL YR 1987 TOTAL 8564.56 MEAN 23.5 MAX 1500 MIN .10 AC-FT 16990
WTR YR 1988 TOTAL 638.47 MEAN 1.74 MAX 35 MIN .00 AC-FT 1270

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
19...	1450	1.2	2150	--	2.0	4.0	--	--	--	--	--
NOV											
24...	1505	1.4	2370	--	9.0	1.5	--	--	--	--	--
MAR											
02...	1205	18	1120	--	0.0	0.5	--	--	--	--	--
08...	1220	7.5	1220	7.98	2.5	0.5	130	27	15	200	75
a08...	1221	7.5	1220	7.98	2.5	0.5	130	28	15	220	77
31...	1100	4.5	1310	--	6.5	0.5	--	--	--	--	--
APR											
15...	1205	2.0	1180	--	11.0	8.0	--	--	--	--	--
JUN											
01...	0945	0.52	2250	--	21.5	20.0	--	--	--	--	--
JUL											
06...	0825	0.15	2420	8.50	25.5	22.0	210	29	33	520	84
a06...	0826	0.15	2420	8.50	25.5	22.0	200	27	32	540	85

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
08...	8	13	250	350	6.8	0.30	8.6	806	674	16.4	1.10
a08...	9	12	245	360	7.8	0.30	7.4	802	798	16.3	1.09
JUL											
06...	16	9.3	680	640	13	0.80	1.1	1710	1670	0.69	2.33
a06...	17	8.6	683	670	9.2	0.70	1.1	1700	1700	0.69	2.31

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)
MAR										
08...	1	230	250	<1	20	70	0.2	1	<1	270
a08...	1	210	180	<5	16	85	<0.1	2	<1	270
JUL										
06...	4	420	130	<1	60	30	0.2	3	<1	630
a06...	3	570	110	<5	50	30	<0.1	2	<1	580

a - Split sample analysis for quality assurance.

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 mi^2, 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: Jan. 4-7, Feb. 18-26, Mar. 13-20, and Sept. 28-30. Records fair.

AVERAGE DISCHARGE.--62 years (1904-06, 1908-15, 1917-19, 1922-24, 1944-88), 96.1 ft^3/s, 69,620 acre-ft/yr; median of yearly mean discharges, 87 ft^3/s, 63,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft^3/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 (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 28	1630	*216	*6.75				

Minimum daily discharge, 0.15 ft^3/s, Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	10	11	2.8	2.8	104	43	15	4.8	3.0	.32	.61
2	7.1	10	11	3.1	3.1	111	40	23	4.8	2.1	.37	.48
3	7.7	11	11	2.4	3.0	153	42	29	4.5	2.0	.47	.33
4	6.9	11	10	2.0	2.6	133	40	34	3.9	2.1	.56	.27
5	6.2	10	10	1.8	2.1	104	27	42	3.6	3.2	.65	.25
6	6.0	10	10	1.6	1.8	91	28	36	2.8	4.0	.61	.23
7	6.5	11	10	1.5	1.6	89	31	31	2.4	8.7	.62	.18
8	7.4	11	10	.79	1.4	77	29	33	2.4	6.1	.43	.15
9	6.7	11	9.0	.76	1.2	68	27	37	2.0	5.2	.52	.25
10	6.7	11	11	.84	1.4	82	25	41	2.0	4.8	.54	.29
11	7.3	10	11	.94	1.2	40	24	46	1.8	3.7	.52	.29
12	7.4	10	8.9	.97	1.4	16	23	42	1.7	3.1	.55	.35
13	7.2	10	9.1	.97	1.4	13	21	35	1.6	3.6	.59	.40
14	7.4	11	9.9	1.0	1.4	10	21	30	2.7	3.3	.66	.56
15	7.5	12	9.4	1.0	1.4	8.0	21	26	2.5	2.6	.86	.77
16	7.6	11	7.6	1.4	1.5	7.0	20	23	2.3	2.2	.71	.70
17	8.4	12	7.9	1.5	1.6	9.0	19	21	2.6	2.0	.60	.79
18	8.4	11	7.0	1.5	1.6	13	18	19	2.5	1.9	.54	1.1
19	10	11	7.0	1.7	1.8	19	18	18	2.3	1.9	.60	1.4
20	8.3	9.8	7.0	1.7	2.0	30	17	16	1.9	2.0	.60	1.6
21	8.8	11	6.9	1.6	3.0	40	16	15	1.7	1.9	.72	1.9
22	9.5	11	7.1	1.8	3.5	96	15	14	1.4	1.7	.55	2.2
23	8.9	11	6.5	1.9	4.0	125	14	13	1.2	1.4	.50	2.3
24	9.5	11	6.5	2.0	15	190	14	11	1.1	1.1	.43	2.3
25	10	9.9	5.4	1.8	18	153	14	10	.89	1.1	.39	1.8
26	11	11	5.2	1.9	14	120	14	9.1	.82	.98	.41	1.8
27	9.8	10	5.1	2.1	63	113	14	7.8	.78	.90	.50	1.9
28	9.7	11	4.9	2.3	159	77	14	8.4	.74	.90	.55	1.9
29	10	11	4.8	2.9	131	58	14	7.2	.58	.70	.55	1.9
30	10	9.4	4.8	2.8	---	54	14	6.0	1.7	.52	.58	1.8
31	10	---	3.3	2.7	---	41	---	5.4	---	.48	.55	---
TOTAL	254.9	320.1	248.3	54.07	446.8	2244.0	677	703.9	66.01	79.18	17.05	30.80
MEAN	8.22	10.7	8.01	1.74	15.4	72.4	22.6	22.7	2.20	2.55	.55	1.03
MAX	11	12	11	3.1	159	190	43	46	4.8	8.7	.86	2.3
MIN	6.0	9.4	3.3	.76	1.2	7.0	14	5.4	.58	.48	.32	.15
AC-FT	506	635	493	107	886	4450	1340	1400	131	157	34	61

CAL YR 1987 TOTAL 44694.8 MEAN 122 MAX 4620 MIN 3.3 AC-FT 88650
WTR YR 1988 TOTAL 5142.11 MEAN 14.0 MAX 190 MIN .15 AC-FT 10200

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
05...	1045	6.1	1870	--	13.0	11.0	--	--	--	--	--
NOV											
23...	1340	11	2590	--	4.5	1.0	--	--	--	--	--
JAN											
07...	1310	1.5	4100	--	-12.0	0.0	--	--	--	--	--
FEB											
24...	1120	3.9	2900	--	-8.0	0.5	--	--	--	--	--
MAR											
07...	1230	86	1720	8.02	2.0	1.0	230	41	31	290	71
25...	1020	128	1770	--	4.0	0.5	--	--	--	--	--
MAY											
26...	1035	8.3	3100	--	29.5	21.0	--	--	--	--	--
JUL											
07...	0950	9.3	2900	8.40	17.0	23.5	360	50	56	580	77
AUG											
15...	1235	0.91	3280	--	35.5	26.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
07...	9	17	330	560	6.9	0.40	8.1	1200	1150	279	1.63
JUL											
07...	14	12	610	1000	8.5	0.60	8.0	2110	2100	53.3	2.87

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)
MAR										
07...	1	270	130	<1	32	110	0.2	1	1	560
JUL										
07...	3	290	30	<1	60	30	<1.0	4	<1	1100

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 mi^2, 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: Dec. 15 to Apr. 10. Records good except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--14 years, 1.80 ft^3/s, 1,300 acre-ft/yr; median of yearly mean discharges, 1.6 ft^3/s, 1,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 940 ft^3/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 ft^3/s and maximum (*).

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 22	1815	*7.0	*a6.56				

No flow Jan. 9 to Feb. 24, Aug. 15-18 and 20-21.
a - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	.66	.68	.08	.00	2.6	1.2	.76	.22	.21	.03	.03
2	.30	.66	.66	.07	.00	2.5	1.3	3.2	.29	.11	.03	.02
3	.30	.67	.69	.05	.00	2.0	1.5	2.8	.29	.09	.03	.02
4	.30	.68	.69	.04	.00	1.6	1.6	1.7	.21	.10	.03	.03
5	.30	.62	.69	.03	.00	1.4	1.5	1.3	.18	.27	.03	.03
6	.30	.62	.70	.03	.00	1.3	1.4	1.3	.15	.21	.02	.02
7	.31	.62	.73	.02	.00	1.2	1.5	1.3	.15	.35	.02	.02
8	.33	.62	.73	.01	.00	1.0	1.3	1.9	.15	.20	.02	.02
9	.33	.63	.73	.00	.00	.94	1.2	2.0	.15	.14	.02	.02
10	.32	.66	.75	.00	.00	.90	1.1	1.7	.13	.09	.01	.02
11	.36	.66	.79	.00	.00	.80	1.0	1.4	.13	.07	.01	.03
12	.38	.66	.75	.00	.00	.50	1.1	1.0	.16	.07	.01	.04
13	.44	.67	.71	.00	.00	.30	.87	.92	.16	.06	.02	.04
14	.41	.69	.64	.00	.00	.20	.88	.82	.17	.06	.01	.04
15	.52	.71	.58	.00	.00	.15	.92	.69	.13	.06	.01	.04
16	.46	.70	.53	.00	.00	.10	.92	.65	.13	.05	.00	.03
17	.52	.66	.47	.00	.00	.09	.90	.63	.13	.05	.00	.03
18	.55	.63	.42	.00	.00	.10	.89	.74	.13	.05	.00	.05
19	.55	.66	.40	.00	.00	.12	.90	.62	.10	.04	.01	.05
20	.55	.64	.39	.00	.00	.15	.90	.56	.08	.04	.00	.04
21	.59	.61	.37	.00	.00	1.0	.92	.53	.07	.04	.00	.05
22	.64	.71	.35	.00	.00	5.0	.87	.51	.07	.03	.01	.04
23	.62	.73	.32	.00	.00	4.0	.86	.51	.08	.03	.01	.05
24	.62	.73	.29	.00	.00	3.0	.89	.46	.05	.03	.01	.04
25	.68	.73	.28	.00	.01	2.0	.81	.37	.06	.03	.01	.04
26	.72	.73	.26	.00	.02	1.5	.86	.33	.06	.03	.01	.05
27	.63	.73	.24	.00	.10	1.4	.85	.31	.05	.03	.02	.05
28	.88	.75	.22	.00	1.0	1.3	.84	.38	.06	.02	.02	.11
29	.73	.77	.20	.00	2.0	1.2	.84	.35	.06	.02	.02	.07
30	.71	.73	.15	.00	---	1.2	.85	.28	.35	.02	.02	.06
31	.67	---	.10	.00	---	1.1	---	.22	---	.02	.02	---
TOTAL	15.33	20.34	15.51	0.33	3.13	40.65	31.47	30.24	4.15	2.62	0.46	1.18
MEAN	.49	.68	.50	.011	.11	1.31	1.05	.98	.14	.085	.015	.039
MAX	.88	.77	.79	.08	2.0	5.0	1.6	3.2	.35	.35	.03	.11
MIN	.30	.61	.10	.00	.00	.09	.81	.22	.05	.02	.00	.02
AC-FT	30	40	31	.7	6.2	81	62	60	8.2	5.2	.9	2.3

CAL YR 1987 TOTAL 898.22 MEAN 2.46 MAX 140 MIN .10 AC-FT 1780
WTR YR 1988 TOTAL 165.41 MEAN .45 MAX 5.0 MIN .00 AC-FT 328

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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												
08...	1108	0.33	1930	8.07	11.0	9.0	10.0	88	570	100	77	260
NOV												
23...	1019	0.74	2040	8.07	5.0	3.0	10.3	78	--	--	--	--
JAN												
07...	1336	0.02	2490	7.56	-5.5	0.0	4.8	33	--	--	--	--
MAR												
01...	1127	2.6	1240	--	3.0	0.0	--	--	--	--	--	--
30...	1215	1.2	940	8.16	4.0	2.0	10.5	77	250	46	33	120
APR												
14...	1059	0.91	1750	8.12	10.0	8.0	9.5	81	--	--	--	--
JUN												
02...	1031	0.30	2140	7.98	27.5	20.5	4.7	53	640	110	88	310
JUL												
07...	1035	0.35	2100	8.37	27.5	22.0	2.7	31	--	--	--	--

DATE	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											
08...	49	5	9.4	493	610	9.5	0.30	12	1440	1370	1.96
MAR											
30...	50	3	10	232	270	6.4	0.20	9.4	645	635	0.88
JUN											
02...	51	5	8.2	546	710	5.3	0.50	14	1550	1570	2.11

DATE	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)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)
OCT											
08...	1.28	<0.100	0.040	0.60	0.040	<0.010	--	--	--	--	340
MAR											
30...	2.04	0.190	0.140	1.3	0.170	0.100	1	1	<10	<0.5	130
JUN											
02...	1.26	<0.100	0.060	0.80	0.100	0.060	--	--	--	--	380

DATE	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT											
08...	--	--	--	--	--	73	--	--	100	--	--
MAR											
30...	<1	<1	<1	1	4	210	<5	<5	98	<0.10	<0.1
JUN											
02...	--	--	--	--	--	40	--	--	340	--	--

06339560 BRUSH CREEK NEAR BEULAH, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CYANIDE TOTAL (MG/L AS CN) (00720)	PHENOLS TOTAL (UG/L) (32730)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
OCT											
08...	--	--	--	--	--	--	11	--	--	30	0.03
MAR											
30...	1	4	<1	<1	10	10	14	<0.010	5	15	0.05
JUN											
02...	--	--	--	--	--	--	13	--	--	13	0.01

06340000 SPRING CREEK AT ZAP, ND

LOCATION.--Lat 47°17'10", long 101°55'31", in SW1/4 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 mi^2.

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: Nov. 6 to Apr. 13 and June 2 to Sept. 30. 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.--43 years, 43.4 ft^3/s, 31,440 acre-ft/yr; median of yearly mean discharges, 41 ft^3/s, 29,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,130 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Feb. 29	----	a*120	a5.63				

Minimum daily discharge, 0.80 ft^3/s, Feb. 11,12.
a - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	13	9.2	2.0	.94	85	22	16	9.0	9.8	3.1	3.3
2	11	13	9.1	1.5	.90	70	24	26	9.0	9.0	3.1	3.3
3	13	13	9.0	1.0	.85	55	26	28	8.6	8.0	3.1	3.3
4	12	13	9.0	.93	.85	52	25	28	8.4	7.2	3.1	3.3
5	11	12	8.9	.89	.85	47	22	34	7.6	9.0	3.2	3.3
6	11	12	8.8	.88	.85	38	23	28	7.0	10	3.1	3.4
7	11	12	8.7	.88	.85	33	22	24	6.6	11	3.1	3.5
8	11	12	8.6	.89	.85	32	20	24	6.4	11	3.1	3.4
9	11	12	8.6	.90	.85	31	19	28	6.2	16	3.1	3.3
10	11	12	8.4	.92	.85	25	19	24	5.8	13	3.1	3.1
11	11	12	8.0	.93	.80	17	18	25	5.6	10	3.0	3.1
12	11	12	7.9	.95	.80	12	19	24	5.6	8.4	2.9	3.8
13	11	12	7.8	.98	.82	11	19	20	5.6	8.0	2.9	4.1
14	11	12	7.6	1.0	.84	10	19	18	6.6	7.4	2.9	4.1
15	11	12	7.6	1.1	.86	10	19	17	7.4	6.4	3.0	4.5
16	12	11	7.4	1.1	.90	11	19	17	7.4	6.0	3.5	5.2
17	12	11	7.4	1.0	.95	13	18	16	7.4	5.2	3.3	5.2
18	12	11	7.2	1.0	1.0	15	18	14	7.2	5.2	3.1	6.6
19	12	11	7.0	1.0	1.0	17	17	13	6.6	5.2	3.1	6.2
20	13	10	6.7	1.0	1.1	20	16	13	5.8	5.0	3.1	5.6
21	12	10	6.4	1.0	1.1	25	16	13	5.6	5.4	3.1	6.2
22	12	10	6.1	.96	1.2	31	16	13	5.4	5.4	3.1	6.2
23	12	10	5.9	.96	1.5	52	16	12	4.7	4.6	3.1	7.2
24	13	10	5.7	.94	2.0	63	16	11	4.7	4.3	3.1	6.8
25	13	10	5.7	.90	7.0	50	16	11	4.5	4.3	3.0	6.4
26	13	10	5.6	.90	19	43	15	11	4.0	4.3	3.0	6.0
27	13	9.6	5.0	.90	58	45	16	11	4.0	4.0	3.0	6.0
28	13	9.5	4.5	.94	60	32	15	10	3.7	3.8	3.0	7.0
29	14	9.4	4.0	1.0	70	27	15	10	3.7	3.6	3.0	7.4
30	13	9.3	3.2	1.0	---	25	15	9.5	6.1	3.4	3.2	7.4
31	13	---	2.5	.95	---	23	---	9.3	---	3.1	3.3	---
TOTAL	371	335.8	217.5	31.30	237.51	1020	560	557.8	186.2	217.0	95.8	148.2
MEAN	12.0	11.2	7.02	1.01	8.19	32.9	18.7	18.0	6.21	7.00	3.09	4.94
MAX	14	13	9.2	2.0	70	85	26	34	9.0	16	3.5	7.4
MIN	11	9.3	2.5	.88	.80	10	15	9.3	3.7	3.1	2.9	3.1
AC-FT	736	666	431	62	471	2020	1110	1110	369	430	190	294

CAL YR 1987 TOTAL 25381.1 MEAN 69.5 MAX 2650 MIN 2.5 AC-FT 50340
WTR YR 1988 TOTAL 3978.11 MEAN 10.9 MAX 85 MIN .80 AC-FT 7890

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT 08...	0907	11	1800	--	9.5	9.0	--	--	--	--	--
NOV 25...	0842	10	1880	--	-1.5	0.5	--	--	--	--	--
JAN 08...	1023	0.89	2750	--	-8.0	0.0	--	--	--	--	--
FEB 25...	0948	6.7	2150	--	5.0	0.5	--	--	--	--	--
MAR 01...	1313	86	1080	--	3.0	0.0	--	--	--	--	--
31...	0851	23	1260	8.34	3.0	0.5	360	68	46	150	47
APR 14...	0919	18	1380	--	7.0	7.5	--	--	--	--	--
JUN 02...	0900	8.9	2010	--	27.5	20.0	--	--	--	--	--
JUL 07...	0847	10	1750	--	26.0	24.5	--	--	--	--	--
AUG 18...	0850	3.1	1710	8.32	18.5	22.0	360	52	56	290	63

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 31...	4	10	268	420	8.7	0.30	11	882	877	54.1	1.20
AUG 18...	7	9.2	430	570	12	0.40	6.7	1280	1270	10.7	1.74

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)
MAR 31...	1	340	110	<1	44	110	0.1	1	2	1200
AUG 18...	3	550	40	<1	80	60	0.1	2	<1	1400

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: Nov. 17 to Apr. 7. Records good except those for period of estimated discharges, which are poor. Slight regulation by Lake Ilo 81 mi upstream, capacity 7,130 acre-ft.

AVERAGE DISCHARGE.--55 years (1930-33, 1938-88), 179 ft^3/s, 129,700 acre-ft/yr; median of yearly mean discharges, 160 ft^3/s, 116,000 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)
Mar. 24	----	*450	ab*7.47				

Minimum daily discharge, 8.4 ft^3/s, Aug. 24-29.
a - From highwater mark.
b - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	51	39	14	11	220	130	47	30	32	9.5	9.5
2	33	50	39	14	10	210	124	71	29	30	9.5	9.5
3	33	49	39	13	9.8	190	124	109	28	26	9.5	9.5
4	32	49	39	11	9.6	190	129	112	27	24	9.5	9.5
5	32	48	38	11	9.5	210	113	102	25	29	9.5	9.5
6	31	48	38	10	9.5	190	102	107	23	33	10	9.8
7	31	48	38	10	9.5	180	96	100	21	34	9.5	10
8	32	48	39	10	9.3	160	88	88	21	35	9.5	9.5
9	31	48	41	11	9.2	170	79	87	20	51	9.5	9.4
10	32	49	40	11	9.2	160	77	103	19	40	9.5	8.7
11	36	49	38	11	9.0	150	72	94	18	31	9.4	8.8
12	38	50	36	11	9.2	120	68	93	18	26	8.9	11
13	39	50	34	11	9.6	100	65	90	18	25	8.9	12
14	39	50	33	12	10	80	61	81	22	23	8.9	12
15	39	50	32	12	11	75	58	70	24	20	9.2	13
16	37	50	31	12	12	70	57	63	24	18	10	15
17	36	48	30	12	12	80	58	58	24	16	9.5	15
18	36	46	29	12	13	100	56	55	23	16	9.0	19
19	36	45	29	11	16	120	54	53	21	16	8.9	18
20	36	45	29	11	18	150	53	51	19	15	8.9	16
21	40	47	29	12	19	190	51	48	18	17	8.9	18
22	44	48	28	12	20	230	50	47	17	17	8.9	18
23	44	49	27	12	24	300	50	45	15	14	8.8	21
24	44	49	25	11	30	400	48	42	15	13	8.4	19
25	44	43	23	11	35	350	47	39	14	13	8.4	18
26	45	40	21	12	60	300	47	37	13	13	8.4	17
27	45	40	19	12	150	250	47	37	13	13	8.4	17
28	45	40	17	12	200	180	46	40	12	12	8.4	20
29	45	40	17	13	230	150	45	38	12	11	8.4	22
30	47	40	16	13	---	140	44	37	20	10	9.2	22
31	49	---	15	12	---	132	---	32	---	9.6	9.5	---
TOTAL	1185	1407	948	362	984.4	5547	2139	2076	603	682.6	282.8	426.7
MEAN	38.2	46.9	30.6	11.7	33.9	179	71.3	67.0	20.1	22.0	9.12	14.2
MAX	49	51	41	14	230	400	130	112	30	51	10	22
MIN	31	40	15	10	9.0	70	44	32	12	9.6	8.4	8.7
AC-FT	2350	2790	1880	718	1950	11000	4240	4120	1200	1350	561	846

CAL YR 1987 TOTAL 82182 MEAN 225 MAX 7980 MIN 15 AC-FT 163000
WTR YR 1988 TOTAL 16643.5 MEAN 45.5 MAX 400 MIN 8.4 AC-FT 33010

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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											
06...	1327	31	1580	8.47	15.5	10.0	--	10.1	90	--	--
NOV											
24...	1100	49	1930	8.48	9.0	1.0	0.30	12.6	89	10	110
JAN											
07...	1030	10	2470	7.92	-7.5	0.0	--	9.8	67	--	--
FEB											
23...	1245	24	1920	7.97	-6.0	0.0	3.9	9.6	66	120	950
MAR											
30...	0908	140	1400	8.40	2.0	1.0	--	11.2	79	--	--
APR											
12...	1053	68	1340	8.55	15.5	10.5	12	10.7	96	170	290
MAY											
31...	1436	30	2100	8.46	31.0	26.5	--	7.9	100	--	--
JUL											
05...	1423	30	1820	8.51	30.5	30.5	--	8.8	119	--	--
AUG											
16...	1019	10	1760	8.28	29.0	24.0	17	7.3	88	500	810

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
OCT										
06...	--	--	--	--	--	--	--	397	435	24
NOV										
24...	430	83	53	320	62	7	8.3	544	580	41
JAN										
07...	--	--	--	--	--	--	--	959	1170	0
FEB										
23...	490	100	57	290	56	6	12	568	693	0
MAR										
30...	--	--	--	--	--	--	--	287	341	5
APR										
12...	300	59	38	230	61	6	7.9	352	415	7
MAY										
31...	--	--	--	--	--	--	--	503	608	3
JUL										
05...	--	--	--	--	--	--	--	464	563	1
AUG										
16...	350	59	49	290	64	7	7.0	490	598	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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
NOV										
24...	540	11	0.60	9.7	1380	1350	1.88	182	0.010	<0.100
FEB										
23...	580	10	0.40	18	1410	1400	1.92	91.4	0.010	0.270
APR										
12...	460	5.1	0.30	6.7	1010	1010	1.37	186	<0.010	<0.100
AUG										
16...	520	8.3	0.40	13	1250	1240	1.70	34.1	<0.010	<0.100

06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHOROUS 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)
NOV 24...	0.040	0.100	0.13	0.40	0.020	0.010	<0.010	<10	1	64
FEB 23...	0.320	0.290	0.37	1.0	0.100	0.060	0.030	<10	1	77
APR 12...	0.020	0.010	0.01	<0.20	0.020	<0.010	<0.010	<10	1	49
AUG 16...	0.030	0.050	0.06	1.3	0.100	0.030	<0.010	<10	3	82

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)
NOV 24...	<0.5	<1	<1	<3	3	11	<5	60	91	<0.1
FEB 23...	<0.5	<1	3	<3	5	130	<5	66	320	<0.1
APR 12...	<0.5	<1	<1	<3	3	12	<5	41	66	0.1
AUG 16...	<0.5	<1	<1	<3	1	8	<5	58	81	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 24...	<10	3	<1	<1.0	1300	<6	5	42	5.5	59
FEB 23...	<10	<1	<1	<1.0	1500	<6	24	118	7.6	21
APR 12...	<10	3	<1	1.0	900	<6	<3	65	12	89
AUG 16...	<10	3	<1	<1.0	1100	<6	7	55	1.5	96

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 mi^2, 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, 9.72 ft, Apr. 21, 1987.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.35	10.46	12.32	13.01	16.85	---	---	12.11	12.41	12.29	11.95	12.05
2	11.68	10.87	12.87	12.40	16.49	---	---	12.06	12.30	12.29	11.94	11.84
3	11.57	10.76	12.60	12.14	16.72	---	---	11.93	11.95	12.30	11.93	12.00
4	11.62	10.25	12.72	12.89	16.95	---	---	11.95	12.23	12.29	11.96	11.96
5	11.40	10.88	12.83	15.78	17.18	---	---	11.99	12.37	12.31	11.94	11.87
6	11.26	10.58	12.66	17.60	17.37	---	---	12.00	12.40	12.31	11.97	11.93
7	10.91	10.66	12.82	17.21	17.17	---	---	12.04	12.37	12.30	11.84	11.45
8	10.45	10.44	12.62	17.29	17.58	---	---	11.97	12.24	12.28	---	11.18
9	10.65	10.66	12.69	17.08	17.31	---	---	12.08	12.32	12.31	---	11.09
10	10.74	10.62	12.50	16.73	17.23	---	---	12.21	12.28	12.30	---	11.23
11	10.74	10.46	12.67	16.08	---	---	---	12.21	12.39	12.30	---	11.05
12	10.47	10.61	12.57	16.35	---	---	---	12.41	12.23	12.33	11.98	11.07
13	10.60	10.86	12.48	16.59	---	---	---	12.55	12.35	12.29	11.96	11.04
14	10.54	10.43	12.67	16.32	---	---	---	12.08	12.22	12.36	12.08	11.30
15	10.68	10.37	12.94	16.29	---	---	12.27	12.10	12.29	12.30	11.96	11.04
16	10.78	10.28	12.78	16.35	---	---	12.14	12.29	12.29	12.23	12.03	11.26
17	10.64	10.55	12.64	16.12	---	---	12.18	12.44	12.33	12.24	12.00	10.85
18	10.71	10.59	12.58	15.99	---	---	11.93	12.37	12.32	12.23	12.00	10.57
19	10.47	10.44	12.56	16.05	---	---	12.06	12.18	12.27	12.31	12.03	10.47
20	10.90	10.65	12.54	16.15	---	---	12.16	12.07	12.32	12.25	11.87	10.36
21	10.68	10.65	12.73	16.02	---	---	12.18	12.36	12.43	12.34	11.89	10.22
22	10.58	10.57	12.79	16.13	---	---	12.16	12.34	12.22	12.27	11.94	9.87
23	10.76	10.63	12.56	16.15	---	---	12.10	12.37	12.27	12.29	11.86	10.14
24	10.67	10.41	12.55	16.25	---	---	12.06	12.41	12.36	12.28	12.02	9.90
25	10.28	11.33	12.28	16.65	---	---	11.66	12.27	12.26	12.29	12.04	10.02
26	10.61	11.65	12.99	16.46	---	---	12.35	12.44	12.28	12.32	12.00	10.01
27	10.55	11.68	12.38	16.34	---	---	12.16	12.24	12.26	12.33	11.92	9.97
28	10.58	11.75	12.78	16.55	---	---	12.01	12.41	12.29	12.30	11.80	9.98
29	10.58	11.62	12.77	16.54	---	---	12.12	12.37	12.32	12.20	12.23	9.88
30	10.43	11.91	12.66	16.53	---	---	12.15	12.41	12.37	11.97	12.03	10.01
31	10.88	---	12.33	16.03	---	---	---	12.39	---	11.93	11.99	---
MEAN	10.80	10.79	12.64	15.94	---	---	---	12.23	12.30	12.27	---	10.85
MAX	11.68	11.91	12.99	17.60	---	---	---	12.55	12.43	12.36	---	12.05
MIN	10.28	10.25	12.28	12.14	---	---	---	11.93	11.95	11.93	---	9.87

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 mi^2, 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 04, 1986.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.63	14.75	16.52	17.58	---	17.64	16.75	16.35	16.67	16.57	16.35	16.54
2	15.88	14.95	17.04	17.15	20.40	17.40	16.62	16.37	16.52	16.57	16.37	16.34
3	15.76	14.80	16.86	16.41	20.52	17.57	16.72	16.13	16.19	16.59	16.34	16.41
4	15.82	14.51	16.99	17.42	20.94	17.38	16.71	16.15	16.43	16.59	16.37	16.38
5	15.69	14.98	17.07	---	20.58	17.44	16.59	16.18	16.55	16.61	16.36	16.36
6	15.62	14.86	16.92	---	21.10	16.74	16.59	16.16	16.61	16.62	16.38	16.37
7	15.25	14.91	16.96	21.53	21.08	16.54	16.68	16.14	16.57	16.62	16.30	15.96
8	14.72	14.72	16.96	21.84	21.51	16.76	16.53	16.19	16.54	16.58	16.36	15.83
9	14.85	14.88	16.89	21.75	21.30	16.83	16.41	16.22	16.52	16.62	16.32	15.67
10	14.97	14.88	16.84	21.60	21.19	16.82	16.37	16.33	16.49	16.60	16.52	15.76
11	14.97	14.73	16.93	21.04	---	16.76	16.01	16.38	16.58	16.59	16.44	15.66
12	14.77	14.87	16.74	21.23	21.25	16.91	16.43	16.41	16.51	16.63	16.39	15.67
13	14.87	15.03	16.74	21.45	21.46	16.71	16.40	16.60	16.54	16.57	16.34	15.58
14	14.83	14.80	16.94	21.20	21.41	16.76	16.45	16.45	16.50	16.66	16.44	15.80
15	14.91	14.73	17.02	21.10	21.02	16.45	16.49	16.29	16.53	16.64	16.39	15.64
16	15.01	14.50	17.06	21.21	21.31	16.67	16.42	16.40	16.52	16.56	16.46	15.78
17	14.92	14.80	16.87	20.88	21.41	16.73	16.45	16.54	16.57	16.57	16.40	15.58
18	14.88	14.90	16.78	20.68	21.45	16.46	16.10	16.58	16.58	16.57	16.44	15.28
19	14.74	14.69	16.81	20.65	21.32	16.66	16.26	16.52	16.54	16.62	16.44	15.20
20	15.09	14.90	16.78	20.71	21.26	16.75	16.36	16.14	16.54	16.58	16.34	15.09
21	14.89	14.95	16.96	20.51	21.05	16.56	16.38	16.53	16.65	16.68	16.32	15.00
22	14.73	14.86	17.07	20.55	20.72	16.40	16.35	16.52	16.52	16.62	16.33	14.66
23	14.73	14.97	16.82	20.60	21.49	16.67	16.39	16.53	16.53	16.64	16.34	14.76
24	14.77	14.65	16.71	20.70	22.39	16.72	16.26	16.57	16.62	16.62	16.43	14.69
25	14.50	15.38	16.66	20.80	22.53	16.57	15.74	16.49	16.57	16.63	16.44	14.70
26	14.85	15.87	17.11	20.73	21.18	16.84	16.59	16.58	16.53	16.66	16.45	14.72
27	14.84	15.97	16.65	20.72	20.27	16.69	16.44	16.51	16.57	16.68	16.40	14.68
28	14.82	16.03	17.09	20.90	18.66	16.75	16.07	16.53	16.56	16.66	16.29	14.72
29	14.79	15.92	16.84	20.92	18.29	16.24	16.27	16.56	16.59	16.58	16.63	14.61
30	14.61	15.98	16.97	21.14	---	16.92	16.31	16.58	16.67	16.38	16.49	14.75
31	14.87	---	16.64	20.50	---	16.63	---	16.59	---	16.37	16.38	---
MEAN	15.02	15.03	16.88	---	---	16.81	16.40	16.40	16.54	16.60	16.40	15.47
MAX	15.88	16.03	17.11	---	---	17.64	16.75	16.60	16.67	16.68	16.63	16.54
MIN	14.50	14.50	16.52	---	---	16.24	15.74	16.13	16.19	16.37	16.29	14.61

06340905 COAL LAKE COULEE NEAR HENSLER, ND

LOCATION.--Lat 47°18'09", long 101°07'52", in SW¼SE¼SE¼ sec.12, T.144 N., R.83 W., McLean County, Hydrologic Unit 10130101, on right bank 100 ft upstream from bridge, on county road 4.5 mi west of Washburn, 3.6 mi northwest of Hensler, and 0.3 mi upstream from mouth.

DRAINAGE AREA.--70.5 mi^2, of which 53.3 mi^2 is probably noncontributing, revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,690 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 4 to Mar. 31. Records good except those for period of estimated discharges, which are poor.

AVERAGE DISCHARGE.--11 years, 2.61 ft^3/s, 1,890 acre-ft/yr; median of yearly mean discharges, 2.2 ft^3/s, 1,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 926 ft^3/s, Aug. 20, 1980, gage height, 8.61 ft, from rating extended above 600 ft^3/s on basis of a culvert computation of peak flow; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft^3/s and maximum (*).

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 31	1000	a*8.0	*1.66				

No flow for several months.
a - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.02	.00	.00	.00	.18	3.3	2.8	.14	.00	.00	.00
2	.00	.03	.00	.00	.00	.13	2.6	4.4	.12	.00	.00	.00
3	.00	.03	.00	.00	.00	.10	2.8	3.1	.04	.00	.00	.00
4	.00	.02	.00	.00	.00	.08	2.8	2.9	.00	.00	.00	.00
5	.00	.01	.00	.00	.00	.07	2.4	2.8	.00	.00	.00	.00
6	.00	.01	.00	.00	.00	.05	2.6	2.8	.00	.00	.00	.00
7	.00	.01	.00	.00	.00	.03	2.7	2.7	.00	.00	.00	.00
8	.00	.01	.00	.00	.00	.02	2.9	2.5	.00	.00	.00	.00
9	.00	.01	.00	.00	.00	.03	3.2	2.1	.00	.00	.00	.00
10	.00	.01	.00	.00	.00	.02	4.5	1.9	.00	.00	.00	.00
11	.00	.01	.00	.00	.00	.01	4.6	1.9	.00	.00	.00	.00
12	.00	.01	.00	.00	.00	.00	5.1	1.7	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	5.1	1.5	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	4.6	1.5	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	4.6	1.3	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	4.8	.91	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	4.7	1.0	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	4.4	1.2	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.01	4.2	1.2	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.05	4.1	.89	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.10	3.8	.87	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.25	3.5	.77	.00	.00	.00	.00
23	.0	.00	.00	.00	.00	.35	3.2	.69	.00	.00	.00	.00
24	.0	.00	.00	.00	.01	.30	3.0	.59	.00	.00	.00	.00
25	.00	.00	.00	.00	.06	.25	2.4	.51	.00	.00	.00	.00
26	.00	.00	.00	.00	.13	.60	2.6	.45	.00	.00	.00	.00
27	.00	.00	.00	.00	.30	1.0	2.7	.37	.00	.00	.00	.00
28	.0	.00	.00	.00	.27	3.0	2.8	.35	.00	.00	.00	.00
29	.01	.00	.00	.00	.21	4.5	2.8	.29	.00	.00	.00	.00
30	.01	.00	.00	.00	---	4.0	2.8	.20	.00	.00	.00	.00
31	.01	---	.00	.00	---	6.0	---	.17	---	.00	.00	---
TOTAL	0.03	0.18	0.00	0.00	0.98	21.13	105.6	46.36	0.30	0.00	0.00	0.00
MEAN	.001	.006	.00	.00	.034	.68	3.52	1.50	.010	.00	.00	.00
MAX	.01	.03	.00	.00	.30	6.0	5.1	4.4	.14	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	2.4	.17	.00	.00	.00	.00
AC-FT	.06	.4	.0	.0	1.9	42	209	92	.6	.0	.0	.0

CAL YR 1987 TOTAL 2021.95 MEAN 5.54 MAX 150 MIN .00 AC-FT 4010
WTR YR 1988 TOTAL 174.58 MEAN .48 MAX 6.0 MIN .00 AC-FT 346

06340905 COAL LAKE COULEE NEAR HENSLER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
FEB									
25...	1419	0.06	1220	--	15.0	0.0	--	--	--
29...	1251	0.21	640	--	9.0	0.5	--	--	--
MAR									
28...	1229	3.0	1680	8.43	2.5	1.0	11.6	83	430
31...	1324	6.6	1160	--	9.0	1.0	--	--	--
APR									
13...	1514	5.3	1370	8.54	12.0	11.5	9.7	89	460
JUN									
01...	1241	0.14	1810	8.49	20.0	19.0	8.7	95	580

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 AD-SORP-TION RATIO (00931)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAR									
28...	59	68	200	4	282	570	1190	27	2300
APR									
13...	56	77	140	3	337	440	968	5	1100
JUN									
01...	84	89	230	4	525	560	1360	8	560

06341000 MISSOURI RIVER AT WASHBURN, ND

LOCATION.--Lat 47°17'20", long 101°02'15", in SE¼SW¼ 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, 9.73 ft, May 7, 1978.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.60	10.74	12.13	13.54	16.99	14.23	---	11.98	12.23	12.09	---	11.96
2	11.79	10.71	12.57	13.40	17.00	13.73	---	12.07	12.12	12.07	11.95	11.76
3	11.69	10.96	12.50	12.35	17.18	13.67	---	11.77	11.87	12.07	11.77	11.79
4	11.76	10.46	12.58	14.08	17.26	13.40	---	11.76	12.02	12.07	11.78	11.77
5	11.63	10.86	12.66	16.63	17.27	13.27	---	11.79	12.14	12.09	11.79	11.79
6	11.60	10.79	12.56	17.41	17.54	12.47	---	11.80	12.19	12.08	11.80	11.77
7	11.24	10.86	12.53	17.49	17.32	12.19	---	11.74	12.15	12.11	11.73	11.37
8	10.78	10.69	12.61	17.72	17.67	12.30	---	11.78	12.12	12.05	11.76	11.25
9	10.91	10.69	12.51	17.69	17.47	12.35	---	11.85	12.10	12.08	11.79	11.06
10	10.93	10.78	12.54	17.56	17.44	12.36	---	11.92	12.09	12.06	11.85	11.10
11	10.96	10.64	12.54	17.06	17.34	12.22	---	12.02	12.14	12.06	11.85	11.04
12	10.81	10.81	12.37	17.13	17.37	---	11.77	---	12.09	12.10	11.81	11.04
13	10.84	10.86	12.40	17.34	17.58	---	12.02	---	12.10	12.04	11.75	10.97
14	10.89	10.74	12.55	17.21	17.59	---	12.03	---	12.09	12.11	11.83	11.15
15	10.84	10.64	12.56	17.18	17.10	---	12.06	---	12.08	12.10	11.81	11.04
16	10.97	10.35	12.68	17.38	17.32	---	---	---	12.07	12.02	11.87	11.14
17	10.91	10.62	12.51	17.17	17.31	---	---	12.16	12.12	12.02	11.80	11.01
18	10.91	10.79	12.43	17.02	17.25	---	---	12.20	12.12	12.02	11.84	10.66
19	10.75	10.54	12.47	17.02	17.14	---	---	12.16	12.08	12.06	11.85	10.52
20	11.01	10.75	12.45	17.11	17.24	---	---	11.80	12.07	12.04	11.76	10.49
21	10.95	10.80	12.57	16.96	17.23	---	---	12.13	12.14	12.11	11.75	10.37
22	10.82	10.72	12.70	16.95	17.21	---	---	12.15	12.06	12.07	11.74	9.99
23	10.93	10.82	12.49	17.01	16.85	12.16	---	12.16	12.04	12.08	11.75	10.06
24	11.02	10.51	12.39	17.13	16.58	12.23	---	12.19	12.11	12.06	11.82	10.04
25	10.49	11.07	12.42	17.20	17.16	---	---	12.15	12.09	12.07	11.83	10.05
26	10.90	11.63	12.67	17.22	17.29	---	12.07	12.19	12.04	12.10	11.86	10.04
27	10.81	11.74	12.37	17.19	17.17	---	12.08	12.15	12.08	12.13	11.80	10.03
28	10.77	11.78	12.71	17.24	15.83	---	11.69	12.12	12.03	12.10	11.71	10.05
29	10.76	11.69	12.46	17.17	15.05	11.82	11.91	12.17	12.09	12.01	12.00	9.95
30	10.52	11.68	12.60	17.37	---	12.35	11.94	12.19	12.18	11.82	11.94	10.07
31	10.63	---	12.35	16.95	---	---	---	12.21	---	11.78	11.80	---
MEAN	11.01	10.89	12.51	16.71	17.13	---	---	---	12.09	12.05	---	10.84
MAX	11.79	11.78	12.71	17.72	17.67	---	---	---	12.23	12.13	---	11.96
MIN	10.49	10.35	12.13	12.35	15.05	---	---	---	11.87	11.78	---	9.95

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 mi^2, approximately, of which 195 mi^2 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. 9-11, 28 to Apr. 8, May 23 to June 8, Aug. 24, and Sept. 2-30. Records fair except for periods of estimated daily discharge, 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 ft^3/s, Mar. 21, 1987, gage height, 6.94 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20 ft^3/s, Mar. 24, gage height, 2.79 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	1.8	.47	.20	.00	1.4	4.0	1.4	1.0	.00	.00	1.3
2	14	2.0	.47	.15	.00	1.3	5.0	4.0	.77	.00	.00	1.2
3	13	1.8	.45	.12	.00	1.2	5.6	12	.50	.00	.00	1.1
4	13	1.5	.45	.05	.00	1.1	4.9	12	.35	.00	.00	.90
5	12	1.4	.46	.00	.00	1.0	5.6	11	.25	.00	.00	.50
6	11	1.3	.45	.00	.00	.95	5.5	8.9	.15	.00	.00	.10
7	14	1.2	.45	.00	.00	.80	6.0	8.5	.10	.00	.00	.02
8	14	1.0	.44	.00	.00	.80	7.0	7.9	.05	.00	.00	.00
9	10	.80	.44	.00	.00	.70	9.2	8.8	.00	.00	.00	2.5
10	10	.70	.48	.00	.00	.70	12	7.9	.00	.00	.00	2.3
11	9.0	.66	.45	.00	.00	.50	11	9.4	.00	.00	.00	2.0
12	7.9	.62	.40	.00	.00	.40	8.9	10	.00	.00	.00	1.5
13	6.1	.56	.40	.00	.00	.30	8.1	8.9	.00	.00	.00	1.0
14	5.4	.60	.39	.00	.00	.25	7.7	9.1	.00	.00	1.5	.80
15	5.3	.56	.37	.00	.00	.23	7.5	8.1	.00	.00	13	1.1
16	4.8	.54	.35	.00	.00	.20	6.5	7.8	.00	.00	2.5	1.5
17	4.1	.54	.35	.00	.00	.15	5.6	8.1	.00	.00	2.2	3.0
18	4.0	.52	.35	.00	.00	.20	7.7	6.3	.00	.00	2.0	4.5
19	3.9	.52	.35	.00	.00	.25	6.1	5.7	.00	.00	2.7	4.8
20	4.2	.50	.35	.00	.00	.35	4.7	6.4	.00	.00	1.9	5.0
21	4.0	.54	.35	.00	.00	1.0	4.1	5.6	.00	.00	.87	4.0
22	4.1	.52	.35	.00	.00	2.0	3.5	4.4	.00	.00	.33	3.0
23	3.6	.52	.33	.00	.00	5.0	3.2	3.7	.00	.00	.12	2.5
24	3.4	.50	.31	.00	.00	15	2.8	3.5	.00	.00	.03	2.0
25	3.2	.50	.30	.00	.05	14	3.5	3.0	.00	.00	.73	3.0
26	2.8	.48	.32	.00	.10	10	3.8	3.2	.00	.00	3.0	3.5
27	2.7	.52	.30	.00	.30	8.0	3.0	3.4	.00	.00	2.2	4.0
28	2.5	.50	.29	.00	1.6	7.0	2.4	3.0	.00	.00	2.4	4.5
29	2.3	.48	.28	.00	1.5	6.5	2.1	2.5	.00	.00	2.7	4.2
30	2.1	.48	.27	.00	---	5.4	1.6	2.0	.00	.00	4.0	3.5
31	1.9	---	.25	.00	---	4.5	---	1.5	---	.00	2.7	---
TOTAL	213.3	24.16	11.67	0.52	3.55	91.18	168.6	198.0	3.17	0.00	44.88	69.32
MEAN	6.88	.81	.38	.017	.12	2.94	5.62	6.39	.11	.00	1.45	2.31
MAX	15	2.0	.48	.20	1.6	15	12	12	1.0	.00	13	5.0
MIN	1.9	.48	.25	.00	.00	.15	1.6	1.4	.00	.00	.00	.00
AC-FT	423	48	23	1.0	7.0	181	334	393	6.3	.0	89	137

CAL YR 1987 TOTAL 7433.50 MEAN 20.4 MAX 767 MIN .08 AC-FT 14740
WTR YR 1988 TOTAL 828.35 MEAN 2.26 MAX 15 MIN .00 AC-FT 1640

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT 09...	1032	10	1980	8.70	1.5	4.0	18	430	22
NOV 19...	1132	0.52	2230	8.68	2.5	1.0	33	430	30
FEB 29...	1035	1.5	1290	--	7.0	0.0	--	--	--
MAR 28...	1017	6.8	1600	8.94	4.0	1.0	3.1	280	18
APR 11...	1028	12	1880	8.86	12.0	5.0	11	330	18
JUN 02...	1458	0.77	2300	9.18	29.0	25.0	31	450	31
AUG 18...	1310	1.9	2260	8.79	26.0	22.0	6.0	430	38

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)
OCT 09...	91	340	61	7	33	830	360	13	0.30
NOV 19...	87	360	63	8	24	890	360	18	0.20
MAR 28...	58	280	67	7	16	567	340	11	0.20
APR 11...	70	340	67	8	24	710	380	12	0.20
JUN 02...	91	460	68	9	21	943	410	13	0.40
AUG 18...	82	440	68	9	14	669	630	22	0.30

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-PHOROUS 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 09...	3.8	1430	1360	1.94	38.6	<0.100	0.070	890	540
NOV 19...	7.5	1520	1420	2.07	2.13	0.160	0.040	910	30
MAR 28...	11	1130	1080	1.54	20.7	<0.100	0.240	590	84
APR 11...	5.8	1310	1280	1.78	42.4	<0.100	0.110	730	54
JUN 02...	8.6	1650	1600	2.24	3.43	<0.100	0.470	1200	40
AUG 18...	28	1710	1660	2.33	8.77	<0.100	0.030	950	60

06341800 PAINTED WOODS CREEK NEAR WILTON, ND

LOCATION.--Lat 47°16'30", long 100°47'30", in SW¼SW¼ 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: Nov. 17 to Mar. 23 and Aug. 29-30. Records good except those for period Nov. 17 to Mar. 23, which are fair. Since the fall of 1982 Missouri River basin water has been diverted into the stream at a point several miles upstream.

AVERAGE DISCHARGE.--6 years (1983-88), 32.8 ft^3/s, 23,760 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, 72 ft^3/s, Mar. 28, gage height, 4.93 ft; minimum daily discharge, 0.07 ft^3/s, Sept. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	3.5	29	27	29	40	25	13	30	38	31	26
2	35	3.7	28	28	27	38	31	15	33	34	32	23
3	27	3.6	27	28	27	36	29	17	31	33	32	8.7
4	34	3.5	30	26	27	35	27	21	30	34	31	2.1
5	35	14	30	23	26	35	22	21	27	33	30	1.1
6	32	33	29	22	25	38	21	21	25	29	28	.69
7	34	34	29	23	25	38	20	18	26	33	28	.52
8	34	34	29	25	26	35	19	21	27	29	31	.26
9	37	31	31	28	26	36	19	19	25	23	32	.11
10	32	31	28	32	24	39	17	19	25	26	32	.07
11	36	34	29	33	22	37	17	22	25	27	33	.74
12	37	33	25	33	23	34	16	39	28	22	32	1.0
13	36	33	23	32	25	17	17	40	28	22	35	1.1
14	37	33	24	31	26	14	15	39	29	27	36	.90
15	37	34	26	31	31	14	15	40	32	28	33	.87
16	36	33	29	30	33	14	14	39	31	30	33	.73
17	36	31	29	30	34	15	15	37	30	30	34	.76
18	35	30	29	30	35	16	14	38	29	31	35	.75
19	33	29	31	29	35	16	14	41	31	30	35	.76
20	35	29	30	28	34	15	14	39	29	30	34	.75
21	37	32	30	30	35	16	13	38	27	32	33	.69
22	38	34	31	29	35	18	13	37	30	32	31	.54
23	37	31	29	30	35	21	13	35	28	30	29	.49
24	34	30	29	29	34	34	12	34	27	32	30	.47
25	13	31	27	27	36	43	14	32	28	30	28	.47
26	7.6	30	26	28	37	26	13	33	28	28	28	.38
27	5.5	32	32	28	38	38	13	33	27	29	27	.38
28	4.8	31	31	29	39	54	13	31	28	28	27	.39
29	4.4	31	30	29	40	39	12	30	28	29	26	.42
30	4.1	29	30	31	---	35	12	27	34	28	25	.42
31	3.4	---	29	30	---	26	---	27	---	27	24	---
TOTAL	880.8	821.3	889	889	889	912	509	916	856	914	955	75.56
MEAN	28.4	27.4	28.7	28.7	30.7	29.4	17.0	29.5	28.5	29.5	30.8	2.52
MAX	38	34	32	33	40	54	31	41	34	38	36	26
MIN	3.4	3.5	23	22	22	14	12	13	25	22	24	.07
AC-FT	1750	1630	1760	1760	1760	1810	1010	1820	1700	1810	1890	150

CAL YR 1987 TOTAL 17255.7 MEAN 47.3 MAX 920 MIN 3.4 AC-FT 34230
WTR YR 1988 TOTAL 9506.66 MEAN 26.0 MAX 54 MIN .07 AC-FT 18860

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT 07...	1447	34	1470	8.59	14.0	10.5	2.4	440	62
NOV 19...	1351	29	1420	8.60	5.0	1.5	1.9	430	61
JAN 11...	1040	33	1480	--	-4.0	0.0	--	--	--
FEB 18...	1204	35	1240	--	3.0	0.5	--	--	--
29...	1414	40	1260	--	12.5	0.5	--	--	--
MAR 31...	1436	26	1160	8.16	9.0	2.0	1.2	340	52
APR 11...	1239	18	1280	8.32	13.0	8.5	5.1	400	61
JUN 01...	1548	32	1380	8.31	24.0	23.0	14	440	67
JUL 06...	1357	28	1360	8.42	32.0	28.0	7.4	400	55
AUG 15...	1230	31	1230	8.28	30.0	24.5	1.1	400	51

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)
OCT 07...	70	160	43	3	15	248	500	17	0.40
NOV 19...	68	160	44	3	14	254	470	20	0.50
MAR 31...	50	130	45	3	10	238	380	13	0.20
APR 11...	59	160	46	4	13	297	450	15	0.30
JUN 01...	67	150	42	3	10	270	500	16	0.50
JUL 06...	65	150	45	3	1.0	237	470	16	0.40
AUG 15...	66	150	44	3	10	240	470	16	0.40

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 07...	7.2	1030	981	1.40	94.0	<0.100	<0.010	310	21
NOV 19...	5.1	1000	951	1.36	79.4	<0.100	0.010	300	12
MAR 31...	12	831	791	1.13	58.8	<0.100	0.120	230	99
APR 11...	9.4	960	946	1.31	45.9	<0.100	0.030	280	24
JUN 01...	7.9	989	981	1.35	85.4	<0.100	0.020	320	10
JUL 06...	5.3	949	905	1.29	71.5	<0.100	0.030	280	6
AUG 15...	5.9	933	914	1.27	79.4	<0.100	0.030	290	8

06342020 MISSOURI RIVER AT PRICE, ND

LOCATION.--Lat 47°04'47", long 100°55'55", in NW1/4 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 mi^2, 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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.36	18.51	19.74	21.07	24.27	23.92	20.28	19.87	20.12	20.11	19.79	19.98
2	19.32	18.42	20.21	21.77	24.59	23.78	20.23	19.96	20.05	20.06	19.83	19.90
3	19.36	18.59	20.35	22.02	24.65	23.87	20.22	19.72	19.93	20.06	19.81	19.85
4	19.41	18.33	20.31	23.10	24.77	23.92	20.31	19.67	19.89	20.06	19.82	19.87
5	19.34	18.43	20.39	23.22	24.86	24.26	20.19	19.69	20.02	20.08	19.84	19.90
6	19.29	18.48	20.36	24.62	25.05	23.73	20.11	19.71	20.10	20.07	19.83	19.84
7	18.99	18.46	20.23	24.96	25.02	22.37	20.19	19.67	20.10	20.12	19.84	19.62
8	18.59	18.36	20.39	25.10	25.16	21.69	20.10	19.72	20.06	20.04	19.77	19.43
9	18.58	18.33	20.23	25.18	25.17	21.31	20.01	19.74	20.01	20.06	19.86	19.20
10	18.54	18.41	20.32	25.06	25.12	20.96	19.83	19.80	20.02	20.04	19.86	19.17
11	18.63	18.32	20.24	24.68	---	20.55	19.59	19.95	20.05	20.03	19.94	19.19
12	18.52	18.41	20.14	24.45	25.07	20.64	19.81	19.93	20.05	20.05	19.89	19.13
13	18.47	18.46	20.15	24.64	25.24	21.51	19.86	20.12	20.00	20.04	19.82	19.13
14	18.54	18.50	20.24	24.68	25.35	22.21	19.88	20.20	20.06	20.06	19.86	19.19
15	18.43	18.29	20.22	24.60	24.95	21.66	19.93	19.89	20.02	20.10	19.91	19.22
16	18.56	18.06	20.44	24.69	25.10	21.01	19.94	19.90	20.02	20.04	19.91	19.24
17	18.56	18.24	20.27	24.61	25.11	20.64	19.90	20.05	20.06	20.01	19.87	19.25
18	18.49	18.42	20.18	24.41	25.06	20.26	19.64	20.13	20.09	20.01	19.88	18.91
19	18.43	18.29	20.20	24.36	24.96	20.23	19.71	20.10	20.06	20.04	19.92	18.69
20	18.50	18.36	20.19	24.43	25.03	20.28	19.77	19.79	20.02	20.06	19.87	18.68
21	18.60	18.43	20.23	24.37	25.05	20.14	19.84	19.96	20.08	20.09	19.84	18.57
22	18.50	18.40	20.39	24.32	25.02	20.09	19.83	20.07	20.08	20.09	19.80	18.29
23	18.50	18.42	20.24	24.38	24.76	20.18	19.91	20.07	20.00	20.10	19.83	18.23
24	18.60	18.27	20.11	24.47	24.43	20.29	19.78	20.08	20.06	20.08	19.83	18.28
25	18.29	18.43	20.22	24.45	24.91	20.17	19.49	20.09	20.06	20.09	19.88	18.20
26	18.38	19.16	20.22	24.60	25.21	20.29	19.74	20.07	20.01	20.10	19.94	18.20
27	18.40	19.43	20.24	24.61	25.11	20.28	19.99	20.11	20.05	20.14	19.89	18.19
28	18.36	19.45	20.34	24.59	24.65	20.31	19.67	20.03	20.01	20.13	19.80	18.19
29	18.40	19.43	20.18	24.58	24.06	20.04	19.78	20.10	20.03	20.06	19.89	18.16
30	18.32	19.35	20.36	24.73	---	20.20	19.85	20.09	20.15	19.92	20.03	18.20
31	18.52	---	20.33	24.58	---	20.25	---	20.14	---	19.83	19.89	---
MEAN	18.67	18.55	20.25	24.24	---	21.32	19.91	19.95	20.04	20.06	19.86	19.00
MAX	19.41	19.45	20.44	25.18	---	24.26	20.31	20.20	20.15	20.14	20.03	19.98
MIN	18.29	18.06	19.74	21.07	---	20.04	19.49	19.67	19.89	19.83	19.77	18.16

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 mi^2.

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.--23 years, 11.8 ft^3/s, 8,550 acre-ft/yr; median of yearly mean discharges, 13 ft^3/s, 9,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft^3/s, June 24, 1966, gage height, 14.35 ft; no flow Feb. 14-26, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 2.5 ft^3/s, July 1, gage height, unknown; minimum daily, 0.80 ft3/s, Feb. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.90	1.6	1.1	1.4	1.4	1.8	1.6	1.2	1.4	2.5	1.1	.88
2	.85	1.7	1.1	1.4	1.4	1.8	1.6	1.7	1.3	2.2	1.0	.86
3	1.0	1.6	1.1	1.3	1.3	1.7	1.7	1.8	1.3	2.0	1.0	.85
4	1.5	1.5	1.1	1.3	1.3	1.7	1.9	1.8	1.3	1.9	1.0	.85
5	2.1	1.4	1.1	1.3	1.2	1.8	1.9	1.7	1.2	2.1	1.0	.85
6	2.0	1.4	1.0	1.3	1.2	1.7	2.0	1.6	1.2	2.0	1.0	.85
7	2.0	1.3	1.0	1.2	1.2	1.7	2.2	1.6	1.1	2.4	1.0	.85
8	2.0	1.2	1.1	1.2	1.1	1.6	2.1	1.5	1.1	1.9	1.0	.85
9	1.9	1.2	1.2	1.2	1.0	1.7	2.0	1.5	1.0	1.6	1.0	.85
10	1.8	1.2	1.4	1.3	.80	1.6	1.9	1.5	1.0	1.5	1.0	.86
11	1.8	1.3	1.3	1.3	.90	1.4	1.8	1.6	1.0	1.4	1.0	.88
12	1.8	1.3	1.3	1.3	1.0	1.2	1.7	1.5	1.0	1.4	1.0	.90
13	1.9	1.2	1.2	1.3	1.0	1.1	1.7	1.4	1.0	1.4	1.0	.90
14	2.0	1.3	1.2	1.4	1.1	1.0	1.6	1.4	1.5	1.4	1.0	1.2
15	2.0	1.2	1.2	1.5	1.3	1.0	1.4	1.4	1.6	1.4	1.0	1.3
16	1.9	1.2	1.1	1.6	1.5	1.0	1.5	1.4	1.4	1.3	1.0	1.2
17	1.9	1.1	1.2	1.6	1.7	1.1	1.4	1.4	1.3	1.3	1.0	1.1
18	2.0	1.2	1.2	1.5	1.9	1.3	1.4	1.4	1.3	1.3	1.0	1.0
19	1.9	1.1	1.3	1.5	1.9	1.3	1.3	1.5	1.2	1.3	1.0	1.1
20	1.8	1.1	1.3	1.5	1.8	1.4	1.3	1.4	1.2	1.3	.98	1.0
21	1.8	1.2	1.4	1.5	1.8	1.5	1.3	1.3	1.2	1.2	.96	1.0
22	1.7	1.1	1.5	1.5	1.8	1.5	1.2	1.3	1.1	1.2	.95	1.0
23	1.7	1.1	1.4	1.4	1.7	1.6	1.2	1.3	1.1	1.2	1.0	.98
24	1.6	1.1	1.4	1.4	1.7	1.7	1.2	1.2	1.1	1.2	.96	.96
25	1.7	1.1	1.4	1.3	1.8	1.6	1.2	1.2	1.1	1.2	.95	.94
26	1.7	1.2	1.5	1.3	2.0	1.6	1.3	1.2	1.1	1.1	.94	.94
27	1.6	1.2	1.6	1.4	1.9	1.6	1.4	1.3	1.1	1.1	.92	1.1
28	1.6	1.2	1.6	1.5	1.8	1.6	1.3	1.5	1.0	1.1	.90	1.4
29	1.5	1.1	1.6	1.5	1.8	1.6	1.3	1.4	1.0	1.1	.90	1.7
30	1.5	1.1	1.5	1.5	---	1.6	1.3	1.4	1.2	1.1	.90	1.8
31	1.5	---	1.4	1.5	---	1.5	---	1.4	---	1.1	.89	---
TOTAL	52.95	37.5	39.8	43.2	42.30	46.3	46.7	44.8	35.4	46.2	30.35	30.95
MEAN	1.71	1.25	1.28	1.39	1.46	1.49	1.56	1.45	1.18	1.49	.98	1.03
MAX	2.1	1.7	1.6	1.6	2.0	1.8	2.2	1.8	1.6	2.5	1.1	1.8
MIN	.85	1.1	1.0	1.2	.80	1.0	1.2	1.2	1.0	1.1	.89	.85
AC-FT	105	74	79	86	84	92	93	89	70	92	60	61

CAL YR 1987 TOTAL 7781.98 MEAN 21.3 MAX 1490 MIN .70 AC-FT 15440
WTR YR 1988 TOTAL 496.45 MEAN 1.36 MAX 2.5 MIN .80 AC-FT 985

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1057	2.0	1290	--	13.0	10.0	--	--	--	--	--
NOV											
23...	1308	1.1	1280	--	6.5	4.0	--	--	--	--	--
JAN											
06...	1128	1.3	1430	--	-12.0	1.0	--	--	--	--	--
FEB											
22...	1052	1.8	1250	--	-6.0	2.5	--	--	--	--	--
MAR											
29...	1021	1.6	1180	8.56	1.0	2.0	280	62	29	160	55
APR											
15...	1127	1.4	1220	--	13.0	11.0	--	--	--	--	--
MAY											
31...	1122	1.4	1260	--	26.5	22.5	--	--	--	--	--
JUL											
05...	1157	2.1	1240	--	32.0	25.5	--	--	--	--	--
AUG											
15...	0905	1.0	1230	8.03	28.0	28.0	310	67	34	190	57

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
29...	4	8.3	373	260	10	0.40	20	786	775	3.31	1.07
AUG											
15...	5	6.6	410	320	9.5	0.40	20	880	903	2.45	1.20

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)
MAR										
29...	2	1100	20	<1	36	110	0.1	2	1	790
AUG										
15...	3	1300	40	<1	40	20	0.2	1	<1	920

06342450 BURNT CREEK NEAR BISMARCK, ND

LOCATION.--Lat 46°54'54", long 100°48'48", in SW¼NW¼SW¼ 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.--Estimated daily discharges: Feb. 27 to June 7. Records poor.

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, 35 ft^3/s, Mar. 25, gage height, 5.46 ft, backwater from ice; no flow for months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	5.0	11	1.0	.80	.00	.00	.00
2	.00	.00	.00	.00	.00	4.0	10	1.5	.60	.00	.00	.00
3	.00	.00	.00	.00	.00	3.8	8.0	2.5	.40	.00	.00	.00
4	.00	.00	.00	.00	.00	2.5	6.5	2.4	.20	.00	.00	.00
5	.00	.00	.00	.00	.00	2.0	5.0	2.3	.10	.00	.00	.00
6	.00	.00	.00	.00	.00	2.0	4.0	2.2	.05	.00	.00	.00
7	.00	.00	.00	.00	.00	2.5	3.0	2.2	.02	.00	.00	.00
8	.00	.00	.00	.00	.00	3.0	2.0	2.1	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	3.5	1.8	2.1	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	3.0	1.5	2.0	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	1.5	1.4	2.0	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	1.0	1.4	2.0	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.50	1.4	1.9	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.20	1.3	1.9	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.10	1.3	1.8	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.05	1.3	1.8	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.10	1.3	1.7	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.20	1.2	1.7	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.40	1.2	1.7	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.60	1.2	1.6	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.80	1.1	1.6	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	1.0	1.1	1.5	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	2.0	1.1	1.5	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	10	1.1	1.4	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	30	1.1	1.3	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	20	1.1	1.2	.00	.00	.00	.00
27	.00	.00	.00	.00	1.5	15	1.1	1.5	.00	.00	.00	.00
28	.00	.00	.00	.00	6.0	14	1.1	1.4	.00	.00	.00	.00
29	.00	.00	.00	.00	5.5	14	1.0	1.2	.00	.00	.00	.00
30	.00	.00	.00	.00	---	13	1.0	1.0	.00	.00	.00	.00
31	.00	---	.00	.00	---	12	---	.90	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	13.00	167.75	76.6	52.90	2.17	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.45	5.41	2.55	1.71	.072	.00	.00	.00
MAX	.00	.00	.00	.00	6.0	30	11	2.5	.80	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.05	1.0	.90	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	26	333	152	105	4.3	.0	.0	.0

WTR YR 1988 TOTAL 312.42 MEAN .85 MAX 30 MIN .00 AC-FT 620

06342450 BURNT CREEK NEAR BISMARCK, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR 02...	1055	3.9	1970	7.25	2.0	0.0	440	59	70	180	46
APR 12...	1415	1.4	1130	--	22.0	15.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 02...	4	21	460	380	15	0.20	6.8	1050	1030	11.0	1.43

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)
MAR 02...	2	190	100	1	120	250	0.1	1	<1	610

06342500 MISSOURI RIVER AT BISMARCK, ND

LOCATION.--Lat 46°48'51", long 100°49'12", in SE¼NW¼SE¼ 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: Jan. 1 to Mar. 22. 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.--60 years (water years 1929-88), 22,680 ft^3/s, 16,430,000 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 34,000 ft^3/s, Feb. 14, gage height, 13.33 ft, backwater from ice; minimum daily, 10,500 ft^3/s, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17800	14700	18800	23000	30500	26000	23100	20200	21500	22100	19800	19900
2	17100	13700	21000	21000	30000	24500	23300	20600	21600	21400	19700	20300
3	17900	14600	23200	19500	30500	24600	22800	20400	21000	21200	19800	19500
4	17700	14500	23100	20500	31000	24800	23200	19300	19800	21300	19700	19700
5	18000	13000	23400	21500	31200	25500	23100	19200	20500	21300	19700	19600
6	17500	14700	23800	21000	31400	25000	22400	19200	21200	21300	19600	19500
7	16900	14000	23300	20000	32500	24400	22400	19300	21500	21500	19800	19300
8	15200	14100	23500	19800	32300	23300	22800	19300	21300	21400	19400	17600
9	13900	13400	23400	20000	32700	23800	22100	19300	20800	21100	19600	16600
10	14100	13900	23200	20800	32600	24100	21300	19600	20900	21200	19400	15800
11	14500	13900	23200	21700	32000	24900	20700	20200	20900	21100	20300	15900
12	14400	13500	23300	22000	32100	23000	19800	20500	21200	21100	20000	15800
13	13600	14000	22800	22200	32300	21900	21000	20800	20800	21300	19800	15800
14	14000	14600	22700	22400	33000	23900	21000	21700	21100	21100	19600	15500
15	13900	13600	23200	23000	32000	24900	21100	21100	21100	21300	19900	16300
16	14200	13100	23800	23100	31000	24200	21300	20100	20900	21300	19800	15700
17	14600	12600	23900	23700	31600	25600	20900	20400	21000	21000	20000	16300
18	14300	13700	23200	23500	31800	28000	20700	21200	21200	21000	19800	15100
19	14300	13900	22900	23900	31500	27000	19600	21500	21200	21000	19900	13500
20	13800	13400	22900	24400	31000	25000	20100	20800	21000	21300	20000	13100
21	14900	14000	22900	25300	31000	24400	20500	19800	21000	21100	19500	12700
22	14600	14100	23500	25100	31100	24200	20600	20900	21400	21400	19500	12000
23	14200	13800	23800	25600	31000	23400	20500	21000	20800	21200	19500	10600
24	14500	13900	22900	26200	29000	24300	20600	21100	20900	21300	19500	11200
25	14400	13200	22700	27600	30000	24400	19900	21300	21200	21200	19800	10600
26	13000	15800	22600	28000	31000	23500	18400	21100	21000	21200	20000	10800
27	14100	17800	23800	28100	31500	24000	20900	21400	20800	21400	20100	10800
28	13800	18400	22700	28500	31000	23800	20600	21000	21100	21500	19700	10700
29	13800	18600	23600	29000	28500	23700	19400	21100	20900	21300	19200	10900
30	13800	18300	23400	30100	---	21900	20000	21200	21600	20800	20500	10500
31	13300	---	23600	31300	---	23700	---	21400	---	19800	20300	---
TOTAL	462100	434800	714100	741800	907100	755700	634100	636000	631200	657500	613200	451600
MEAN	14910	14490	23040	23930	31280	24380	21140	20520	21040	21210	19780	15050
MAX	18000	18600	23900	31300	33000	28000	23300	21700	21600	22100	20500	20300
MIN	13000	12600	18800	19500	28500	21900	18400	19200	19800	19800	19200	10500
AC-FT	916600	862400	1416000	1471000	1799000	1499000	1258000	1262000	1252000	1304000	1216000	895700

CAL YR 1987 TOTAL 7203400 MEAN 19740 MAX 30700 MIN 10300 AC-FT 14290000
WTR YR 1988 TOTAL 7639200 MEAN 20870 MAX 33000 MIN 10500 AC-FT 15150000

06342500 MISSOURI RIVER AT BISMARCK, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
29...	1130	13800	630	--	17.5	9.0	--	--	--	--	--
APR											
12...	1515	19900	710	7.70	22.0	8.0	230	55	23	68	38
MAY											
26...	1250	20400	730	--	29.0	14.5	--	--	--	--	--
SEP											
02...	1130	19500	730	8.07	21.0	15.5	240	56	24	68	38
a02...	1131	19500	730	8.07	21.0	15.5	250	59	25	71	38

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
12...	2	4.7	180	190	12	0.50	5.3	493	468	26500	0.67
SEP											
02...	2	4.4	200	210	14	0.60	4.6	504	511	26500	0.69
a02...	2	4.3	170	200	11	0.50	6.8	481	480	25300	0.65

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										
12...	2	230	10	1	47	0	0.2	1	3	520
SEP										
02...	3	130	10	<1	50	<10	0.2	1	<1	620
a02...	2	130	6	<5	53	3	0.4	1	1	580

a - Split sample analysis for quality assurance.

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND

LOCATION.--Lat 46°52'11", long 102°49'37", in NE¼NW¼SW 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 earthfill 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 elevation 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, 9,880 acre-ft, Mar. 28, elevation, 2,419.75 ft; minimum, 5,360 acre-ft, Sept. 27-30, elevation 2,414.72 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,419.30	9,370	--
Oct. 31	2,418.90	8,930	-440
Nov. 30	2,418.84	8,870	-60
Dec. 31	2,418.76	8,790	-80
CAL YR 1987	-	-	-1,470
Jan. 31	2,418.68	8,700	-90
Feb. 29	2,418.92	8,950	+250
Mar. 31	2,419.71	9,840	+890
Apr. 30	2,419.28	9,350	-490
May 31	2,418.92	8,950	-400
June 30	2,417.67	7,700	-1,250
July 31	2,416.67	6,820	-880
Aug. 31	2,415.47	5,880	-940
Sept. 30	2,414.72	5,360	-520
WTR YR 1988	-	-	-4,010

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 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
OCT 22...	1500	3.30	25.0	3.5	100	315	10	701	--	939	8.50	5.0
JAN 04...	1525	3.30	24.0	-19.0	0	315	10	705	1.30	1100	8.50	3.5
APR 07...	1005	3.30	28.0	17.0	50	225	5.0	691	--	1180	8.40	7.0
JUL 05...	0940	3.30	25.5	--	5	0	0	693	--	1490	8.50	22.5

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	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)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
OCT 22...	18	30.0	11.2	95	190	41	21	140	61	5	7.8
JAN 04...	14	134	13.6	111	250	54	27	170	59	5	10
APR 07...	18	38.0	12.6	114	220	47	26	180	62	5	8.4
JUL 05...	22	28.0	7.0	89	280	56	33	230	63	6	10

DATE	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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT 22...	203	280	6.2	0.30	5.6	643	624	0.87	0.140	0.050	180
JAN 04...	256	360	7.4	0.40	3.7	813	787	1.11	0.110	0.020	230
APR 07...	248	400	8.5	0.30	3.8	1010	823	1.37	<0.100	0.030	220
JUL 05...	280	470	11	0.40	4.7	990	983	1.35	<0.100	0.080	260

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT							
22...	1455	0.0	930	8.40	4.5	11.4	95
22...	1457	1.60	930	8.50	4.5	11.2	93
22...	1500	3.30	939	8.50	5.0	11.2	95
22...	1503	6.60	940	8.50	5.0	11.2	93
22...	1505	13.1	940	8.50	5.0	11.5	96
22...	1507	19.7	940	8.50	5.0	11.4	95
22...	1510	26.4	940	8.50	5.0	11.5	96
JAN							
04...	1520	0.0	1080	8.50	3.5	12.7	102
04...	1523	1.60	1100	8.50	3.5	13.4	108
04...	1525	3.30	1100	8.50	3.5	13.6	111
04...	1527	6.60	1100	8.50	3.5	13.8	111
04...	1530	13.1	1100	8.60	3.5	11.3	91
04...	1532	19.7	1200	8.40	4.0	8.8	71
04...	1535	26.4	1190	8.20	4.0	8.8	71
APR							
07...	1000	0.0	1160	8.40	7.0	12.0	111
07...	1002	1.60	1180	8.40	7.0	12.6	117
07...	1005	3.30	1180	8.40	7.0	12.6	114
07...	1007	6.60	1180	8.40	6.5	12.6	117
07...	1010	13.1	1180	8.40	6.0	12.6	117
07...	1012	19.7	1180	8.40	6.0	12.6	117
07...	1015	26.4	1180	8.40	6.0	12.2	113
JUL							
05...	0935	0.0	1530	8.50	23.0	7.1	90
05...	0938	1.60	1530	8.50	22.5	7.1	90
05...	0940	3.30	1490	8.50	22.5	7.0	89
05...	0942	6.60	1460	8.50	22.0	6.6	84
05...	0945	13.1	1440	8.50	21.5	6.3	80
05...	0947	19.7	1440	8.50	21.0	5.7	72
05...	0950	26.4	1440	8.50	21.0	1.1	14

06344300 HEART RIVER AT DICKINSON, ND

LOCATION.--Lat 46°51'56", long 102°44'10", in SW¼NW¼SE¼ 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: Dec. 31 to Feb. 22. Records good except those for period of estimated discharges, which are fair. Flow regulated by Edward Arthur Patterson Lake (station 06343500) 10 mi upstream.

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, 110 ft^3/s, July 5, gage height, 4.58 ft; minimum daily discharge, 0.98 ft^3/s, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	1.9	2.0	1.4	1.7	3.7	2.2	5.7	1.8	6.8	1.5	2.5
2	1.6	1.9	2.1	1.5	1.6	3.1	2.2	35	1.7	2.8	.98	2.6
3	1.6	2.0	2.1	1.3	1.5	2.8	2.2	6.7	1.8	2.4	3.2	3.5
4	1.4	2.0	2.2	1.0	1.6	2.9	2.2	2.8	1.9	2.6	2.2	3.0
5	1.5	1.9	2.1	1.2	1.5	3.2	2.4	2.1	1.7	41	2.1	2.6
6	1.7	1.9	2.1	1.3	1.5	3.3	2.3	4.2	1.7	5.2	2.0	2.5
7	1.7	2.0	2.1	1.3	1.6	3.3	2.2	4.7	1.7	18	2.2	2.3
8	1.8	2.0	2.1	1.3	1.6	3.4	2.1	16	1.4	4.4	2.1	2.3
9	1.8	1.9	2.1	1.4	1.6	3.1	2.0	7.3	1.5	3.2	2.0	2.2
10	1.8	1.9	2.2	1.6	1.7	3.2	2.1	3.0	1.3	3.0	2.0	1.9
11	1.8	2.1	2.2	2.2	1.7	2.7	1.9	2.4	1.3	2.9	1.9	1.7
12	1.9	2.2	2.1	2.2	1.9	2.8	2.5	2.2	1.3	3.2	1.8	2.1
13	1.9	2.0	2.2	2.0	2.1	2.2	5.5	1.8	1.4	4.0	1.7	2.2
14	1.7	3.1	2.0	1.9	2.1	2.1	5.2	1.7	5.6	3.4	2.0	2.1
15	1.9	2.6	2.0	1.9	2.4	2.2	5.2	1.7	4.5	2.9	2.3	2.3
16	2.3	2.3	1.9	2.0	3.2	2.2	5.4	1.5	2.2	2.9	2.4	3.1
17	2.5	1.9	2.0	2.0	3.4	2.3	5.3	1.3	1.9	2.9	2.1	3.0
18	2.0	1.9	2.0	1.9	3.4	2.7	5.2	1.7	2.6	2.9	1.9	4.4
19	2.0	1.9	2.0	1.9	4.9	3.7	5.2	1.7	2.0	2.6	1.7	8.3
20	1.9	1.9	2.1	1.8	2.8	4.5	4.9	1.6	1.7	2.1	1.7	3.2
21	1.9	2.0	2.0	1.8	3.4	3.7	4.9	1.6	1.7	2.2	1.7	2.8
22	1.9	2.1	1.9	1.9	10	4.2	4.8	1.4	1.7	2.0	1.7	2.9
23	1.9	2.1	2.0	1.9	3.6	5.4	4.8	1.0	2.5	2.0	1.7	2.8
24	1.8	2.1	1.9	2.1	3.0	3.7	4.8	1.0	2.4	1.8	1.7	2.4
25	2.0	2.1	1.8	1.8	3.9	3.1	4.6	1.4	1.6	1.6	1.6	2.0
26	2.1	2.1	1.9	1.9	11	2.4	5.0	2.3	1.7	1.7	1.7	1.8
27	2.1	2.0	1.9	2.0	16	2.3	5.2	2.1	1.8	1.6	1.5	1.6
28	2.0	2.0	1.8	2.0	11	2.2	5.3	2.0	2.1	1.7	1.8	1.6
29	2.1	2.0	1.8	2.1	5.2	2.0	5.3	1.8	1.7	1.7	2.5	1.7
30	2.0	2.0	1.8	2.1	---	2.3	5.5	1.7	19	1.5	2.9	1.9
31	2.0	---	1.3	2.0	---	2.0	---	1.7	---	1.4	2.7	---
TOTAL	58.5	61.8	61.7	54.7	110.9	92.7	118.4	123.1	77.2	138.4	61.28	79.3
MEAN	1.89	2.06	1.99	1.76	3.82	2.99	3.95	3.97	2.57	4.46	1.98	2.64
MAX	2.5	3.1	2.2	2.2	16	5.4	5.5	35	19	41	3.2	8.3
MIN	1.4	1.9	1.3	1.0	1.5	2.0	1.9	1.0	1.3	1.4	.98	1.6
AC-FT	116	123	122	108	220	184	235	244	153	275	122	157

CAL YR 1987 TOTAL 15244.2 MEAN 41.8 MAX 2650 MIN 1.3 AC-FT 30240
WTR YR 1988 TOTAL 1037.98 MEAN 2.84 MAX 41 MIN .98 AC-FT 2060

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
08...	1535	2.0	2080	--	9.5	9.5	--	--	--	--	--
NOV											
24...	1325	2.1	1960	--	7.5	4.0	--	--	--	--	--
JAN											
11...	1420	2.4	2700	--	-14.0	0.0	--	--	--	--	--
FEB											
22...	1340	13	1590	--	-7.0	0.5	--	--	--	--	--
MAR											
03...	1145	2.6	1440	--	4.0	0.5	--	--	--	--	--
APR											
01...	1035	2.1	1490	8.20	15.5	4.5	280	58	32	230	64
a01...	1036	2.1	1490	8.20	15.5	4.5	270	57	32	240	65
MAY											
17...	1055	1.4	1580	--	21.0	16.0	--	--	--	--	--
JUN											
10...	1225	1.4	2150	--	36.0	24.5	--	--	--	--	--
23...	1340	2.3	2280	8.70	39.0	28.0	390	75	48	380	67
a23...	1341	2.3	2280	8.70	39.0	28.0	390	77	48	390	68
AUG											
11...	1715	1.8	2280	--	32.0	24.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
01...	6	6.0	320	430	36	0.30	4.3	1010	991	5.81	1.37
a01...	6	4.3	321	430	35	0.40	5.3	1000	998	5.75	1.36
JUN											
23...	9	16	370	710	84	0.70	16	1600	1560	10.1	2.18
a23...	9	10	380	720	87	0.60	5.8	1580	1570	9.94	2.15

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										
01...	1	270	10	<1	33	240	0.1	3	<1	600
a01...	1	270	9	<5	29	280	<0.1	2	<1	610
JUN										
23...	3	510	30	<1	50	10	0.2	4	<1	850
a23...	4	510	20	<5	50	<10	<0.1	4	1	840

a - Split sample analysis for quality assurance.

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 Sept. 30. Records poor.

AVERAGE DISCHARGE.--24 years, 17.2 ft^3/s, 12,460 acre-ft/yr; median of yearly mean discharge, 17 ft^3/s, 12,300 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)
Feb. 28	1230	*52	a5.62	Sept. 30	1400	---	*a6.09

No flow June 10 to Sept. 13.
a - Backwater from beaver dam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.3	1.0	.30	.05	27	2.5	3.5	.40	.00	.00	.00
2	.70	1.4	1.1	.30	.05	16	2.4	4.1	.35	.00	.00	.00
3	1.4	1.5	1.2	.30	.05	15	2.3	4.0	.30	.00	.00	.00
4	2.1	1.5	1.2	.30	.05	10	2.3	4.0	.25	.00	.00	.00
5	2.1	1.5	1.2	.20	.05	9.4	1.8	3.5	.20	.00	.00	.00
6	2.4	1.6	1.3	.10	.05	8.3	2.3	3.3	.20	.00	.00	.00
7	1.7	1.6	1.3	.10	.05	7.5	2.5	3.2	.15	.00	.00	.00
8	2.2	1.7	1.3	.05	.05	9.4	2.5	3.3	.10	.00	.00	.00
9	2.2	1.8	1.3	.05	.05	8.8	2.5	3.1	.05	.00	.00	.00
10	1.7	1.8	1.3	.05	.05	7.7	2.5	3.1	.00	.00	.00	.00
11	2.2	1.7	1.2	.05	.05	3.5	2.4	2.3	.00	.00	.00	.00
12	2.0	1.8	1.1	.05	.10	3.2	2.5	1.8	.00	.00	.00	.00
13	2.2	1.8	1.1	.05	.20	3.5	3.2	1.5	.00	.00	.00	.00
14	1.8	1.8	1.0	.05	.30	3.5	3.1	1.7	.00	.00	.00	.01
15	1.9	1.8	.90	.10	.40	3.9	3.3	1.5	.00	.00	.00	.03
16	2.0	1.7	.70	.10	.50	3.2	3.7	1.1	.00	.00	.00	.04
17	2.1	1.6	.60	.20	.59	2.8	3.7	1.2	.00	.00	.00	.06
18	2.0	1.7	.60	.15	.70	2.8	3.5	1.3	.00	.00	.00	.08
19	2.0	1.6	.70	.15	.90	3.7	3.5	1.2	.00	.00	.00	.08
20	1.7	1.6	.70	.10	.90	5.6	3.2	1.3	.00	.00	.00	.07
21	1.6	1.5	.80	.10	.90	8.5	3.0	1.6	.00	.00	.00	.09
22	1.6	1.4	.80	.10	.90	11	3.3	1.8	.00	.00	.00	.10
23	1.6	1.5	.80	.15	.90	10	3.5	1.5	.00	.00	.00	.09
24	1.4	1.4	.70	.10	.70	9.4	3.4	1.5	.00	.00	.00	.11
25	1.4	1.4	.60	.05	.50	6.0	3.1	1.8	.00	.00	.00	.10
26	1.3	1.4	.50	.05	8.5	5.2	2.8	1.5	.00	.00	.00	.11
27	1.2	1.3	.60	.10	16	7.0	2.6	1.4	.00	.00	.00	.11
28	1.2	1.2	.60	.10	32	5.4	2.6	1.1	.00	.00	.00	.14
29	1.1	1.1	.70	.15	25	3.7	3.4	.90	.00	.00	.00	.16
30	1.1	1.0	.50	.10	---	3.2	3.9	.70	.00	.00	.00	.28
31	1.2	---	.40	.05	---	2.8	---	.44	---	.00	.00	---
TOTAL	52.90	46.0	27.80	3.80	90.54	227.0	87.3	64.24	2.00	0.00	0.00	1.66
MEAN	1.71	1.53	.90	.12	3.12	7.32	2.91	2.07	.067	.00	.00	.055
MAX	2.4	1.8	1.3	.30	32	27	3.9	4.1	.40	.00	.00	.28
MIN	.70	1.0	.40	.05	.05	2.8	1.8	.44	.00	.00	.00	.00
AC-FT	105	91	55	7.5	180	450	173	127	4.0	.0	.0	3.3

CAL YR 1987 TOTAL 8819.63 MEAN 24.2 MAX 1320 MIN .40 AC-FT 17490
WTR YR 1988 TOTAL 603.24 MEAN 1.65 MAX 32 MIN .00 AC-FT 1200

06344600 GREEN RIVER NEAR NEW HRADEC, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
01...	1140	1.1	1200	--	20.0	12.5	--	--	--	--	--
NOV											
20...	1500	1.6	1500	--	7.0	2.0	--	--	--	--	--
JAN											
04...	1205	0.29	1900	--	-18.5	1.0	--	--	--	--	--
FEB											
16...	0950	0.48	1490	--	-1.0	0.0	--	--	--	--	--
29...	1030	19	1500	7.89	5.0	0.5	220	42	29	240	68
MAR											
14...	1140	3.6	1450	--	1.5	0.5	--	--	--	--	--
24...	1450	10	1140	--	10.5	1.0	--	--	--	--	--
APR											
11...	0945	2.7	1120	--	13.0	7.0	--	--	--	--	--
MAY											
31...	1010	0.56	1640	--	25.5	22.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
29...	7	16	240	510	15	0.20	6.5	1030	1010	52.6	1.40

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)
FEB										
29...	1	420	130	<1	20	350	<0.1	2	<1	360

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 mi^2, 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. 28-30 and Dec. 5 to Apr. 7. Records good except those for periods of estimated daily discharge, which are fair. Flow is regulated by Patterson Lake Reservoir (station 06343500) 85 river miles upstream from station and some diversions for irrigation and water supply at low flow.

AVERAGE DISCHARGE.--63 years (water years 1904-07, 1909-22, 1944-88), 106 ft^3/s, 76,800 acre-ft/yr; median of yearly mean discharges, 99 ft^3/s, 71,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft^3/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 ft^3/s; flood of Mar. 25, 1943, reached a stage of 24.2 ft from floodmarks, discharge, 11,700 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 150 ft^3/s, Mar. 24; maximum gage height observed, 6.31 ft, Mar. 24, backwater from ice; minimum daily discharge, 0.09 ft^3/s, Aug. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	14	12	3.0	1.5	40	32	21	6.0	2.2	.49	.25
2	9.0	14	14	2.5	1.5	35	39	28	5.6	3.4	.60	.27
3	8.3	14	13	2.5	1.0	30	36	35	5.3	7.0	.58	.24
4	8.6	14	12	2.0	1.0	25	59	61	4.8	11	.50	.19
5	8.7	13	11	1.9	1.0	30	94	36	3.9	8.4	.39	.17
6	8.2	13	11	2.0	.80	25	59	25	3.1	7.1	.24	.15
7	8.8	13	11	2.0	1.0	20	53	21	2.7	17	.17	.13
8	9.6	13	10	2.0	1.5	15	47	24	2.6	21	.13	.12
9	9.0	13	10	2.0	1.5	20	37	41	2.3	13	.14	.67
10	7.9	13	11	2.0	1.0	25	31	53	1.9	14	.11	1.8
11	9.9	13	12	1.5	.80	30	26	48	1.7	10	.10	2.1
12	11	13	10	1.5	1.0	30	24	28	2.0	7.5	.09	2.3
13	9.3	13	11	1.5	1.5	35	23	22	1.8	6.0	.14	2.3
14	10	14	10	2.0	1.2	30	21	18	2.0	5.2	.15	2.4
15	11	15	9.0	2.0	1.0	30	23	16	2.0	4.5	.17	2.8
16	11	15	8.0	2.0	.90	27	32	14	2.0	4.1	.34	3.2
17	13	15	8.5	2.0	1.0	25	30	14	1.7	3.6	.45	3.6
18	14	14	9.0	2.0	3.5	30	30	13	1.5	3.5	.43	3.6
19	15	12	8.5	2.0	2.5	25	29	12	4.6	3.5	.41	4.0
20	17	13	7.5	2.5	2.0	25	23	11	4.5	2.9	.34	4.6
21	17	14	7.0	2.5	5.5	30	22	11	3.0	2.2	.25	4.8
22	16	14	7.5	2.5	5.0	50	23	11	2.2	1.8	.18	6.2
23	16	14	6.0	2.5	4.5	70	22	10	1.6	1.5	.20	7.7
24	16	14	5.5	2.0	4.0	140	22	9.8	1.7	1.4	.20	6.3
25	16	13	5.0	1.5	6.0	110	22	9.2	1.8	1.3	.21	5.4
26	16	14	6.0	2.0	10	90	22	9.2	1.5	1.1	.25	4.3
27	16	13	5.5	2.5	15	100	22	8.3	1.1	.99	.25	4.1
28	17	12	5.0	3.0	25	62	21	8.0	.83	.77	.21	5.0
29	16	12	5.5	3.0	70	65	21	6.9	.71	.58	.17	5.1
30	16	12	5.0	2.5	---	77	21	6.3	1.6	.45	.16	4.8
31	14	---	3.5	2.0	---	42	---	6.5	---	.34	.22	---
TOTAL	384.6	403	270.0	66.9	172.20	1388	966	637.2	78.04	167.33	8.27	88.59
MEAN	12.4	13.4	8.71	2.16	5.94	44.8	32.2	20.6	2.60	5.40	.27	2.95
MAX	17	15	14	3.0	70	140	94	61	6.0	21	.60	7.7
MIN	7.9	12	3.5	1.5	.80	15	21	6.3	.71	.34	.09	.12
AC-FT	763	799	536	133	342	2750	1920	1260	155	332	16	176

CAL YR 1987 TOTAL 54366.2 MEAN 149 MAX 4550 MIN 3.5 AC-FT 107800
WTR YR 1988 TOTAL 4630.13 MEAN 12.7 MAX 140 MIN .09 AC-FT 9180

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
05...	1535	8.3	1750	--	6.5	11.5	--	--	--	--	--
NOV											
23...	1305	15	1850	--	4.0	1.0	--	--	--	--	--
JAN											
05...	1410	1.9	2800	--	-17.0	0.5	--	--	--	--	--
FEB											
17...	1515	0.97	3900	--	5.5	0.5	--	--	--	--	--
MAR											
16...	1410	27	1540	7.80	1.0	0.5	360	73	43	210	55
28...	1155	62	1140	--	1.0	1.0	--	--	--	--	--
APR											
11...	1420	25	1270	--	24.0	11.5	--	--	--	--	--
MAY											
09...	1405	46	1900	--	23.0	15.5	--	--	--	--	--
20...	1335	11	2050	--	21.0	17.0	--	--	--	--	--
JUN											
07...	1010	2.6	2080	8.40	31.5	24.5	470	78	66	320	59
20...	1125	4.7	2140	--	37.0	24.5	--	--	--	--	--
AUG											
08...	1350	0.13	2230	--	17.5	21.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
15...	5	12	300	520	14	0.40	8.1	1110	1060	81.8	1.51
JUN											
07...	7	13	360	810	18	0.50	4.8	1550	1540	10.9	2.11

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)
MAR										
16...	1	370	80	<1	34	40	0.2	2	1	930
JUN										
07...	2	510	30	<1	60	10	0.5	6	<1	1400

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 mi^2, 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 earthfill 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 elevation 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, 40,840 acre-ft, Mar. 6, 1962, elevation, 2,052.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 67,710 acre-ft, May 12, elevation, 2,062.06 ft; minimum, 47,160 acre-ft, Sept. 27, elevation, 2,055.10 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,059.83	60,710	--
Oct. 31	2,058.82	57,660	-350
Nov. 30	2,059.02	58,260	+600
Dec. 31	2,059.15	58,650	+390
CAL YR 1987	-	-	-18,190
Jan. 31	2,059.10	58,500	-150
Feb. 29	2,059.16	58,680	+180
Mar. 31	2,061.25	65,130	+6,450
Apr. 30	2,061.79	66,840	+1,710
May 31	2,061.28	65,220	-1,620
June 30	2,059.11	58,530	-6,690
July 31	2,056.83	51,900	-6,630
Aug. 31	2,055.44	48,070	-3,830
Sept. 30	2,055.14	47,260	-810
WTR YR 1988	-	-	-13,450

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA

PERIOD OF RECORD.--Water years 1971, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
OCT												
21...	1220	1.60	43.0	1.5	100	180	15	753	0.0	940	8.40	8.0
FEB												
02...	1010	0.0	41.3	-18.0	0	295	<5.0	759	1.70	1120	8.20	1.5
APR												
26...	1015	0.0	44.5	5.0	100	300	3.0	759	--	1120	8.30	8.5
JUL												
26...	1330	0.0	54.0	39.0	10	--	<5.0	754	--	1240	8.60	22.5

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	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)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
OCT											
21...	4	68.0	9.8	84	250	50	30	120	50	3	8.3
FEB											
02...	4	263	13.2	95	260	51	33	140	52	4	9.9
APR											
26...	5	156	11.1	95	280	53	35	150	53	4	9.3
JUL											
26...	--	98.0	8.3	98	290	54	38	160	53	4	10

DATE	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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT											
21...	201	320	4.3	0.30	5.7	672	659	0.91	<0.100	0.020	220
FEB											
02...	238	370	8.0	0.30	8.3	774	764	1.05	0.120	0.010	220
APR											
26...	231	360	7.3	0.30	4.2	759	759	1.03	0.180	0.010	240
JUL											
26...	244	410	8.8	0.30	2.3	835	830	1.14	<0.100	0.030	240

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT							
21...	1215	0.0	935	8.40	8.0	9.9	84
21...	1220	1.60	940	8.40	8.0	9.8	84
21...	1225	3.30	941	8.40	8.0	9.8	84
21...	1230	6.60	942	8.40	8.0	9.8	84
21...	1235	13.2	942	8.40	8.0	9.8	84
21...	1240	19.8	943	8.40	8.0	9.8	84
21...	1245	26.4	943	8.40	8.0	9.8	84
21...	1250	33.0	943	8.40	8.0	9.8	84
21...	1255	39.6	943	8.40	8.0	9.8	84
21...	1300	42.9	943	8.40	8.0	9.8	84
21...	1305	3.30	944	8.40	8.0	9.8	84
FEB							
02...	1010	0.0	1120	8.20	1.5	13.2	95
02...	1012	1.60	1120	8.30	2.0	13.0	94
02...	1014	3.30	1110	8.40	2.0	12.9	93
02...	1016	6.60	1120	8.40	2.0	12.9	93
02...	1020	13.2	1120	8.40	2.0	12.7	92
02...	1022	19.8	1160	8.40	2.0	12.0	87
02...	1024	26.4	1180	8.30	2.0	12.1	88
02...	1026	33.0	1250	8.30	2.0	10.0	72
02...	1028	38.8	1280	8.10	3.0	6.3	47
APR							
26...	1015	0.0	1120	8.30	8.5	11.1	95
26...	1017	1.60	1120	8.30	8.5	11.1	95
26...	1018	3.30	1120	8.30	8.5	11.0	94
26...	1020	6.60	1120	8.30	8.5	11.0	94
26...	1022	13.2	1120	8.30	8.5	11.0	94
26...	1024	19.8	1120	8.30	8.5	11.0	94
26...	1026	26.4	1120	8.30	8.5	11.0	94
26...	1028	33.0	1120	8.30	8.5	11.0	94
26...	1030	39.6	1120	8.30	8.5	11.0	94
JUL							
26...	1330	0.0	1240	8.60	22.5	8.3	98
26...	1333	1.60	1230	9.20	25.0	8.0	93
26...	1336	3.30	1230	8.90	23.0	8.2	95
26...	1339	6.60	1240	8.80	22.5	7.9	92
26...	1341	13.2	1240	8.80	22.0	7.9	92
26...	1345	19.8	1240	8.70	22.0	7.7	89
26...	1348	26.4	1240	8.60	22.0	7.6	88
26...	1351	33.0	1240	8.60	22.0	7.6	88
26...	1354	39.6	1240	8.60	22.0	7.3	85
26...	1357	46.2	1240	8.50	21.5	7.0	81
26...	1400	52.8	1240	8.50	21.5	6.9	79

06348000 HEART RIVER NEAR LARK, ND

LOCATION.--Lat 46°36'37", long 101°22'54", in NW¼NW¼SW¼ 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 mi^2, 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: Oct. 30-31, Mar. 1-5, 10-20, July 19-20. Records good except those for period Mar. 22 to Apr. 2 which are fair and those for periods Mar. 1-5, 10-20, and July 19-20 which are poor. Flow regulated by Lake Tschida (06346000) 45 mi upstream since 1949.

AVERAGE DISCHARGE.--35 years, (1947-82) 225 ft^3/s, 163,000 acre-ft/yr; median of yearly mean discharges, 172 ft^3/s, 124,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,200 ft^3/s, Apr. 17, 1950, gage height, 20.70 ft, from rating curve extended above 11,000 ft^3/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 about 350 ft^3/s, Mar. 26, gage height, unknown; minimum daily recorded, 0.3 ft^3/s, Feb. 1-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.30	100	65	48	103	85	35	28
2					.30	90	65	43	113	65	42	24
3					.30	70	70	60	113	60	47	21
4					.30	60	75	53	111	50	47	20
5					.30	64	71	43	111	35	48	19
6					.30	60	58	42	109	25	48	19
7					.30	56	52	42	100	15	53	17
8					.30	50	50	45	71	30	61	16
9					.30	55	47	46	68	50	59	13
10					.30	50	45	43	63	60	47	9.4
11					.30	45	42	39	64	70	34	6.3
12					.30	35	38	43	61	80	32	6.3
13					.30	33	36	46	66	85	20	6.3
14					.30	30	36	43	79	90	16	5.8
15					.30	30	35	41	81	95	16	6.6
16					.30	31	33	41	74	90	18	6.7
17					.30	32	30	42	64	75	21	7.0
18					.30	33	28	61	58	60	28	6.9
19					.30	34	28	72	46	54	38	7.0
20					.30	35	26	74	30	50	38	9.5
21					.30	35	24	72	20	48	37	13
22					.30	40	22	72	15	49	37	11
23					.30	45	21	71	10	50	37	11
24					.30	100	21	63	15	50	34	11
25					1.0	250	19	39	20	50	24	10
26					4.0	300	16	30	22	49	19	9.9
27					10	220	14	29	25	48	19	9.3
28					40	150	11	33	30	45	26	9.0
29					70	90	13	58	45	42	27	9.7
30					---	80	77	65	60	35	27	10
31					---	70	---	86	---	31	27	---
TOTAL					132.20	2373	1168	1585	1847	1721	1062	358.7
MEAN					4.56	76.5	38.9	51.1	61.6	55.5	34.3	12.0
MAX					70	300	77	86	113	95	61	28
MIN					.30	30	11	29	10	15	16	5.8
AC-FT					262	4710	2320	3140	3660	3410	2110	711

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1115	64	1070	--	10.5	8.5	--	--	--	--	--
FEB											
29...	1210	69	1010	--	7.0	0.5	--	--	--	--	--
APR											
07...	1415	52	1080	8.48	14.0	14.0	270	50	35	150	54
MAY											
25...	0955	39	1330	--	21.5	18.5	--	--	--	--	--
JUL											
01...	1420	85	1240	--	19.5	19.5	--	--	--	--	--
AUG											
09...	1015	59	1300	8.22	21.5	19.0	300	53	40	190	57

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	4	7.9	270	330	6.6	0.20	3.2	759	745	107	1.03
AUG											
09...	5	9.9	290	420	10	0.40	0.40	929	920	148	1.26

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										
07...	2	280	20	<1	38	40	<0.1	2	2	530
AUG										
09...	2	260	10	<1	40	10	0.2	1	<1	750

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 mi^2, 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: Nov. 8 to Apr. 6. Records good except those for period of estimated daily discharges, which are fair. Flow regulated by Lake Tschida (station 06346000) 105 mi upstream since 1949. Some diversions above station.

AVERAGE DISCHARGE.--55 years (water years 1929-32, 1938-88), 268 ft^3/s, 194,200 acre-ft/yr; median of yearly mean discharges, 210 ft^3/s, 152,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 30,500 ft^3/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, about 1,370 ft^3/s, Mar. 28, gage height, 5.06 ft, backwater from ice; minimum daily discharge, 0.34 ft^3/s, Feb. 6-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	54	12	.88	.54	80	300	19	48	55	31	25
2	80	51	15	.87	.45	250	230	34	70	72	42	26
3	82	49	21	.86	.39	200	190	65	92	73	36	27
4	83	46	34	.86	.36	170	160	58	101	58	35	28
5	80	44	26	.85	.35	190	140	70	99	38	31	23
6	79	43	30	.85	.34	210	120	72	91	24	28	22
7	80	41	33	.84	.34	220	108	56	88	16	33	20
8	81	40	28	.84	.34	150	97	48	81	10	37	19
9	78	38	24	.83	.34	130	86	44	74	6.2	46	16
10	81	32	22	.82	.34	160	86	49	53	12	44	16
11	83	38	25	.82	.34	130	79	50	35	14	44	17
12	84	45	20	.81	.34	110	73	43	33	42	32	17
13	85	42	15	.80	.34	96	64	38	33	56	27	17
14	84	41	11	.80	.34	80	56	31	47	60	21	16
15	85	41	9.6	.79	.34	70	51	36	51	63	17	17
16	86	41	13	.78	.34	85	50	46	69	66	13	17
17	87	41	19	.77	.34	110	45	46	66	64	6.8	15
18	87	25	16	.76	.34	140	41	51	63	65	3.3	15
19	87	18	11	.75	.34	150	38	55	54	55	3.8	14
20	87	15	8.6	.75	.34	130	38	54	45	33	5.5	14
21	86	20	6.6	.74	.34	120	36	78	38	23	2.5	14
22	86	30	5.0	.74	.34	110	34	78	24	21	21	14
23	86	40	4.0	.73	.34	140	32	73	11	21	24	14
24	87	24	3.3	.73	.34	200	30	69	5.0	18	23	16
25	86	32	2.6	.72	3.0	300	28	60	3.1	23	22	17
26	86	39	2.2	.71	20	470	28	49	1.5	21	23	16
27	80	34	1.8	.68	140	820	26	45	6.9	20	28	17
28	79	30	1.5	.66	120	950	25	29	22	18	20	18
29	80	35	1.2	.65	100	430	25	23	23	20	15	20
30	75	17	.96	.63	---	380	21	27	34	19	12	20
31	61	---	.90	.60	---	340	---	29	---	15	19	---
TOTAL	2554	1086	423.26	23.92	391.55	7121	2337	1525	1461.5	1101.2	745.9	547
MEAN	82.4	36.2	13.7	.77	13.5	230	77.9	49.2	48.7	35.5	24.1	18.2
MAX	87	54	34	.88	140	950	300	78	101	73	46	28
MIN	61	15	.90	.60	.34	70	21	19	1.5	6.2	2.5	14
AC-FT	5070	2150	840	47	777	14120	4640	3020	2900	2180	1480	1080

CAL YR 1987 TOTAL 173474.26 MEAN 475 MAX 13000 MIN .90 AC-FT 344100
WTR YR 1988 TOTAL 19317.33 MEAN 52.8 MAX 950 MIN .34 AC-FT 38320

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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											
22...	1130	86	1140	8.10	1.5	2.5	5.1	12.6	93	70	69
DEC											
08...	1250	28	1500	8.23	6.0	1.0	2.7	12.8	91	K1	44
JAN											
19...	1500	0.75	2500	--	-4.0	0.0	--	--	--	--	--
FEB											
24...	1150	0.34	2370	8.36	-7.0	0.5	0.90	4.0	28	2	120
MAR											
04...	1510	168	--	--	5.0	0.5	--	--	--	--	--
APR											
06...	1050	117	1240	8.57	18.5	7.0	3.3	11.3	95	K2	54
MAY											
05...	0950	67	--	--	--	10.0	--	--	--	--	--
24...	1420	69	1440	--	25.5	24.5	--	--	--	--	--
JUN											
29...	0950	22	1860	8.44	17.5	19.0	1.4	8.2	89	1	K780
AUG											
10...	1105	37	1510	8.43	28.0	24.0	2.0	8.7	104	73	120

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
OCT										
22...	310	62	37	170	54	4	2.5	319	316	36
DEC										
08...	370	72	46	240	58	6	7.3	454	554	0
FEB										
24...	520	110	60	390	61	8	11	710	818	24
APR										
06...	280	52	36	180	58	5	7.4	284	342	2
JUN										
29...	310	48	47	300	67	8	11	360	400	19
AUG										
10...	280	44	40	230	64	6	8.9	332	366	19

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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT										
22...	360	8.6	0.30	5.9	839	837	1.14	195	<0.010	0.110
DEC										
08...	380	17	0.40	6.9	1060	1040	1.44	80.7	<0.010	0.200
FEB										
24...	660	60	0.50	15	1740	1730	2.37	1.60	<0.010	0.150
APR										
06...	400	8.0	0.30	4.8	859	857	1.17	271	<0.010	<0.100
JUN										
29...	560	19	0.60	8.8	1230	1200	1.67	72.7	<0.010	<0.100
AUG										
10...	450	12	0.30	5.5	978	989	1.33	97.7	<0.010	<0.100

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHOROUS 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 22...	0.030	0.060	0.08	0.50	0.010	0.030	0.010	<10	1	63
DEC 08...	0.030	0.050	0.06	0.40	0.010	<0.010	<0.010	--	--	--
FEB 24...	0.590	0.680	0.88	0.90	0.010	0.010	<0.010	<10	1	200
APR 06...	0.030	0.050	0.06	1.5	0.120	0.010	<0.010	<10	1	47
JUN 29...	0.040	0.020	0.03	1.0	0.030	0.010	<0.010	--	--	--
AUG 10...	<0.010	<0.010	--	0.90	0.030	0.030	<0.010	10	1	54

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 22...	<0.5	2	2	<3	4	5	<5	35	10	0.1
FEB 24...	<10	<1	<1	1	1	50	<5	110	650	0.3
APR 06...	<0.5	<1	<1	<3	1	17	<5	43	6	0.3
AUG 10...	<0.5	<1	<1	<3	<1	6	<5	53	4	0.5

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 22...	<10	1	<1	1.0	660	<6	26	69	16	81
FEB 24...	2	1	<1	<1.0	1300	<1	20	40	0.04	36
APR 06...	<10	5	<1	<1.0	570	<6	5	36	11	74
MAY 05...	--	--	--	--	--	--	--	87	16	81
AUG 10...	<10	3	<1	<1.0	660	<6	13	20	2.0	91

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT								
22...	1112	5.0	0.50	2.5	1140	8.00	12.4	--
22...	1114	10.0	0.50	2.5	1140	8.10	12.5	--
22...	1116	15.0	0.50	2.5	1140	8.10	12.5	--
22...	1118	20.0	0.50	2.5	1140	8.10	12.5	--
22...	1120	25.0	0.50	2.5	1140	8.10	12.6	--
22...	1122	30.0	0.50	2.0	1140	8.10	12.6	--
22...	1124	35.0	0.50	2.0	1140	8.10	12.6	--
22...	1125	40.0	0.50	2.0	1140	8.10	12.6	--
22...	1126	45.0	0.50	2.0	1150	8.20	12.7	--
22...	1128	50.0	0.50	2.0	1150	8.20	12.6	--
22...	1130	56.0	0.50	2.5	1140	8.10	12.6	93
APR								
06...	1050	30.0	0.50	7.0	1240	8.57	11.3	95
06...	1052	50.0	0.50	7.0	1240	8.57	11.3	--
06...	1054	70.0	0.50	7.0	1240	8.46	11.5	--
AUG								
10...	1105	--	--	24.0	1510	8.43	8.7	104
10...	1130	10.0	0.50	24.5	1500	8.43	8.9	106
10...	1135	20.0	0.50	23.5	1500	8.43	8.8	105
10...	1140	30.0	0.50	23.5	1510	8.43	8.7	104
10...	1145	40.0	0.50	23.5	1510	8.43	8.7	104
10...	1150	50.0	0.50	23.5	1510	8.43	8.7	104
10...	1200	60.0	0.50	23.5	1510	8.43	8.7	104

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.

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	20.86	21.83	---	---	26.75	22.51	21.92	22.35	22.48	22.05	22.04
2	---	20.67	22.27	---	---	26.55	22.54	22.01	22.38	22.35	22.02	22.14
3	---	20.80	22.72	---	---	26.43	22.42	22.03	22.27	22.32	22.04	21.98
4	---	20.85	22.78	---	---	26.55	22.46	21.78	22.02	22.34	21.93	22.00
5	---	20.47	---	---	---	26.63	22.45	21.75	22.12	22.35	22.00	21.98
6	---	20.81	---	---	---	26.83	22.33	21.75	22.26	22.34	21.98	21.97
7	---	20.73	---	27.06	---	26.40	22.31	21.76	22.34	22.37	22.03	21.93
8	---	20.75	---	28.09	---	26.09	22.34	21.77	22.32	22.35	21.96	21.54
9	---	20.58	---	28.74	---	26.17	22.24	21.78	22.23	22.31	21.98	21.35
10	---	20.63	---	---	---	26.33	22.09	21.84	22.23	22.32	21.98	21.16
11	---	20.69	---	---	---	26.59	21.95	21.96	22.22	22.30	22.15	21.15
12	---	20.59	---	---	---	25.41	21.75	22.01	22.30	22.30	22.09	21.12
13	---	20.70	---	---	---	24.88	21.98	22.11	22.22	22.33	22.06	21.11
14	---	20.82	---	---	---	25.50	21.99	22.30	22.27	22.30	22.00	21.04
15	---	20.69	---	---	---	26.02	22.03	22.22	22.26	22.34	22.07	21.23
16	---	20.54	---	---	---	26.02	22.07	22.02	22.24	22.36	22.04	21.09
17	---	20.38	---	---	---	26.28	22.00	22.05	22.24	22.28	22.08	21.21
18	---	20.61	---	---	---	26.33	21.97	22.22	22.29	22.28	22.04	21.03
19	---	20.71	---	---	---	25.70	21.72	22.30	22.29	22.26	22.04	20.63
20	---	20.57	---	---	---	24.79	21.84	22.19	22.24	22.32	22.07	20.49
21	---	20.71	---	---	---	23.84	21.91	21.95	22.26	22.29	21.96	20.39
22	---	20.77	---	---	---	23.07	21.97	22.18	22.33	22.34	21.96	20.22
23	---	20.69	---	---	---	22.57	21.95	22.22	22.22	22.31	21.96	19.86
24	---	20.70	---	---	---	22.63	21.98	22.24	22.23	22.33	21.96	19.98
25	---	20.51	---	---	---	22.62	21.86	22.28	22.28	22.31	22.02	19.88
26	---	21.06	---	---	27.61	22.55	21.51	22.26	22.25	22.33	22.06	19.89
27	---	21.60	---	---	27.82	22.68	21.98	22.31	22.22	22.34	22.10	19.91
28	---	21.77	---	---	27.79	22.59	22.03	22.27	22.27	22.38	22.03	19.89
29	20.67	21.83	---	---	27.10	22.63	21.74	22.25	22.24	22.35	21.91	19.91
30	20.67	21.77	---	---	---	22.28	21.89	22.26	22.36	22.25	22.16	19.82
31	20.53	---	---	---	---	22.63	---	22.29	---	22.05	22.15	---
MEAN	---	20.83	---	---	---	24.91	22.06	22.07	22.26	22.32	22.03	20.93
MAX	---	21.83	---	---	---	26.83	22.54	22.31	22.38	22.48	22.16	22.14
MIN	---	20.38	---	---	---	22.28	21.51	21.75	22.02	22.05	21.91	19.82

06349215 LONG LAKE CREEK ABOVE LONG LAKE, 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, in farmyard and 4.0 miles southeast of Moffit.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April to July 1988.

REMARKS.--Miscellaneous measurements made at this location are published in another section of this report.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	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)
APR 06...	1335	14	1728	20.5	763	648	8.23	5.0	10.8	84
JUL 21...	1315	0.26	1728	28.0	772	960	8.50	22.5	8.2	94

DATE	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	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)
APR 06...	2.6	K2	240	140	30	17	81	53	3	7.6
JUL 21...	--	150	190	230	49	26	130	54	4	9.7

DATE	ALKA-LINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)
APR 06...	208	254	0	130	4.8	0.20	15	8	410	410
JUL 21...	438	520	7	72	9.4	0.40	24	35	599	581

DATE	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 DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)
APR 06...	0.56	15.6	<0.010	<0.100	0.030	0.80	0.80	0.150	0.090	0.070
JUL 21...	0.81	0.42	0.010	0.100	0.090	0.80	1.5	0.960	0.710	0.760

464245100092000 LONG LAKE POOL 3 NEAR MOFFIT, ND

LOCATION.--Lat 46°42'45", long 100°09'20", in NE¼SW¼ sec.4, T.137 N., R.75 W., Burleigh County, Hydrologic Unit 10130103, near center of pool, and 7 miles northeast of Moffit.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to July 1988.

REMARKS.--Phytoplankton samples were collected on July 21. These data are available from the U.S. Geological Survey district office in Bismarck.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)
MAR											
03...	1030	1711	3.00	6.0	-0.5	--	14	150	767	4000	8.43
JUL											
20...	0950	1711	3.00	5.2	16.0	0	5.0	290	773	4000	9.24
21...	1145	1711	0.50	--	--	--	--	--	--	3800	--

DATE	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L) (00310)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)
MAR											
03...	0.5	12.0	10.5	73	1.1	<4	K10	330	30	61	910
JUL											
20...	18.0	3.00	8.5	90	2.3	K10	K80	240	16	49	800
21...	23.2	--	--	--	--	--	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICARBONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CARBONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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										
03...	83	22	66	1060	1050	120	1200	62	0.30	34
JUL										
20...	86	23	38	988	883	158	980	60	0.20	21

DATE	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	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, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
MAR										
03...	28	3130	2990	4.26	0.0	0.020	0.270	0.030	2.5	3.0
JUL										
20...	180	2520	2550	3.43	0.0	<0.010	<0.100	0.050	1.5	2.7

DATE	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	ARSENIC TOTAL (UG/L AS AS) (01002)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)
MAR										
03...	1.30	1.20	1.10	47	<10	2600	<10	3	<50	30
JUL										
20...	0.750	0.470	0.500	--	--	--	--	--	--	--

464245100092000 LONG LAKE POOL 3 NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI) (01132)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	STRON-TIUM, TOTAL RECOV-ERABLE (UG/L AS SR) (01082)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)
MAR										
03...	1800	<100	520	90	0.10	5	<1	470	7	20

DATE	TIME	SAM-PLING DEPTH (FEET) (00003)	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)
MAR							
03...	1030	3.00	4000	8.43	0.5	10.5	73
03...	1032	2.20	4000	8.44	0.5	10.8	76
03...	1035	3.00	4000	8.43	0.5	10.5	73
03...	1040	4.00	4000	8.44	1.0	8.2	58
03...	1045	5.00	4000	8.43	1.0	6.7	48
03...	1050	6.00	4000	8.43	1.0	1.5	11
JUL							
20...	0950	3.00	4000	9.24	18.0	8.5	90
20...	0952	0.0	4000	9.24	18.0	8.5	90
20...	0955	1.60	4000	9.23	18.0	8.5	90
20...	1000	3.30	4000	9.24	18.0	8.5	90
20...	1005	5.20	--	--	18.0	8.2	86

464010100121800 LONG LAKE POOL 2 NEAR MOFFIT, ND

LOCATION.--Lat 46°40'10", long 100°12'18", in NW¼SW¼ sec.19, T.137 N., R.75 W., Burleigh County, Hydrologic Unit 10130103, near center of pool, and about 4 miles east of Moffit.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1988.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)
MAR 02...	1355	1716	1.50	5.2	-1.0	50	5.0	330	770	2800	8.48

DATE	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L) (00310)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)
MAR 02...	2.0	13.0	7.5	55	1.0	<5	K10	390	57	60	590

DATE	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICARBONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CARBONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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 02...	74	13	47	894	969	60	760	36	0.40	30

DATE	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	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, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
MAR 02...	5	2140	2110	2.91	0.0	0.030	0.340	0.040	2.0	2.3

DATE	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	ARSENIC TOTAL (UG/L AS AS) (01002)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)
MAR 02...	1.00	0.900	0.930	33	<10	1500	<10	5	<50	30

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI) (01132)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	SELENIUM, TOTAL (UG/L AS SE) (01147)	STRONTIUM, TOTAL RECOVERABLE (UG/L AS SR) (01082)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)
MAR 02...	2500	<100	380	90	0.10	7	<1	500	11	20

464010100121800 LONG LAKE POOL 2 NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
MAR							
02...	1355	1.50	2800	8.48	2.0	7.5	55
02...	1357	2.20	2800	8.44	1.0	7.1	50
02...	1400	3.00	2800	8.48	2.0	7.5	55
02...	1405	4.00	2850	8.52	2.5	6.2	45
02...	1410	5.20	2900	8.58	2.5	3.2	23

464052100160700 LONG LAKE POOL 1 NEAR MOFFIT, ND

LOCATION.--Lat 46°40'52", long 100°16'07", in SW¼NW¼SW¼ sec.15, T.137 N., R.76 W., Burleigh County, Hydrologic Unit 10130103, near center of pool, and 1½ miles east of Moffit.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to July 1988.

REMARKS.--Phytoplankton samples were collected on July 21. These data are available from the U.S. Geological Survey district office in Bismarck.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
MAR												
02...	1100	1715	3.00	5.0	-3.0	0	9.0	330	773	2100	8.37	2.5
APR												
06...	1210	1715	2.00	5.0	11.5	10	5.0	225	763	1440	8.62	5.5
JUL												
20...	0845	1715	1.50	3.2	14.5	0	5.0	290	772	2300	9.11	17.5
21...	1045	1715	--	--	--	--	--	--	--	2300	--	22.0

DATE	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L) (00310)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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												
02...	12.0	6.3	46	3.6	<5	<5	350	53	54	450	71	11
APR												
06...	13.0	12.0	95	--	<3	400	200	31	30	250	71	8
JUL												
20...	2.00	8.6	89	3.9	<20	K80	240	23	45	410	77	12

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICARBONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CARBONATE WATER WH IT FIELD MG/L AS CO3 (00447)	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)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)
MAR											
02...	40	804	883	48	590	25	0.40	28	27	1780	1720
APR											
06...	17	430	466	29	340	15	0.20	12	1	968	948
JUL											
20...	22	616	605	72	550	26	0.30	18	316	1530	1460

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	ARSENIC TOTAL (UG/L AS AS) (01002)
MAR											
02...	2.42	0.0	<0.010	0.310	0.030	1.8	2.3	0.810	0.670	0.710	18
APR											
06...	1.32	0.0	<0.010	<0.100	<0.010	1.1	1.3	0.440	0.360	0.310	--
JUL											
20...	2.08	0.0	<0.010	<0.100	0.070	1.7	3.7	1.20	0.540	0.590	--

464052100160700 LONG LAKE POOL 1 NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS) (01003)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01013)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD) (01028)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01029)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU) (01043)
MAR											
02...	5	--	<1	--	--	1	--	<10	--	--	20
02...	--	<10	--	1200	<10	--	3	--	<50	30	--

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB) (01052)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI) (01132)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/G AS HG) (71921)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, TOTAL IN BOTTOM MATERIAL (UG/G) (01148)	STRONTIUM, TOTAL RECOVERABLE (UG/L AS SR) (01082)
MAR											
02...	--	--	<10	--	--	--	<0.01	--	--	<1	--
02...	1600	<100	--	350	60	0.10	--	5	<1	--	510

DATE	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN) (01093)	CYANIDE TOTAL IN BOTTOM MATERIAL (UG/G AS CN) (00721)	PHENOLS TOTAL (UG/L) (32730)	ALDRIN, TOTAL (UG/L) (39330)	CHLORDANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DIELDRIN TOTAL (UG/L) (39380)
MAR											
02...	--	--	50	<0.5	--	--	--	--	--	--	--
02...	10	10	--	--	2	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010

DATE	ENDOSULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	METHOXYCHLOR, TOTAL (UG/L) (39480)	MIREX, TOTAL (UG/L) (39755)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PCB, TOTAL (UG/L) (39516)	PERTHANE TOTAL (UG/L) (39034)	TOXAPHENE, TOTAL (UG/L) (39400)
MAR											
02...	--	--	--	--	--	--	--	--	--	--	--
02...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.10	<0.1	<0.1	<1

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)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
MAR							
02...	1100	3.00	2100	8.37	2.5	6.3	46
02...	1104	2.10	2100	8.37	2.5	7.5	55
02...	1108	3.00	2100	8.37	2.5	6.3	46
02...	1112	4.00	2100	8.32	3.0	7.2	53
02...	1116	5.00	2100	8.30	3.0	7.2	53
APR							
06...	1155	0.0	1430	8.65	5.5	12.0	95
06...	1158	1.00	1430	8.64	5.5	12.0	95
06...	1201	2.00	1440	8.63	5.5	12.0	95
06...	1204	3.00	1440	8.63	5.5	12.0	95
06...	1207	4.00	1440	8.62	5.5	12.0	95
06...	1208	5.00	1440	8.62	5.5	12.0	95
06...	1210	2.00	1440	8.62	5.5	12.0	95
JUL							
20...	0845	1.50	2300	9.11	17.5	8.6	89
20...	0847	0.0	2300	9.11	17.5	8.6	89
20...	0850	1.60	2300	9.12	17.5	8.6	89
20...	0855	3.20	2300	9.12	17.5	8.7	90

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 mi^2, approximately, of which about 500 mi^2 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: Oct. 4-8, Nov. 12-18, 27 to Mar. 26, June 13-26, July 4 to Aug. 31, and Sept. 14-30. Records fair except those for periods of estimated daily discharge, which are poor.

AVERAGE DISCHARGE.--43 years, 34.4 ft^3/s, 24,920 acre-ft/yr; median of yearly mean discharges, 22 ft^3/s, 15,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,750 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 29	1444	130	6.78				

Minimum daily discharge, 0.02 ft^3/s, July 20-29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	3.7	3.8	2.5	.90	3.2	39	7.8	3.3	3.8	.05	.23
2	9.6	3.7	4.0	2.4	.90	3.0	36	8.7	3.0	3.0	.06	.03
3	9.7	3.9	4.0	2.3	.90	2.8	30	9.4	3.3	2.7	.07	.04
4	9.0	4.3	4.0	2.0	.80	2.6	27	9.6	3.0	2.0	.08	.04
5	8.5	4.4	4.0	1.7	.80	2.4	23	9.1	2.0	1.0	.09	.04
6	8.0	4.5	4.1	1.6	.80	6.0	21	8.9	1.7	.70	.12	.05
7	7.5	4.8	4.1	1.5	.80	15	20	8.8	1.3	.50	.15	.05
8	7.0	4.9	4.5	1.4	.80	20	19	8.5	.83	.40	.20	.07
9	6.2	4.6	4.5	1.4	.80	15	19	8.2	.58	.30	.25	.10
10	5.8	4.4	4.5	1.4	.80	12	18	7.9	.39	.22	.28	.11
11	5.6	4.3	4.5	1.3	.80	9.0	17	7.4	.26	.19	.30	.10
12	5.7	4.3	4.5	1.3	.80	7.0	16	7.3	.24	.16	.32	.09
13	5.6	4.3	4.4	1.3	.80	5.0	15	7.4	.20	.16	.36	.14
14	5.4	4.3	4.2	1.3	.80	4.5	15	7.2	.14	.16	.40	.15
15	5.4	4.2	4.0	1.3	.80	3.5	14	6.5	.09	.13	.55	.15
16	6.0	4.2	4.0	1.2	.90	3.2	14	5.6	.08	.10	.50	.20
17	5.6	4.2	3.8	1.2	.90	3.0	13	5.1	.08	.08	.50	.20
18	5.1	4.2	3.8	1.2	.90	3.4	13	6.9	.08	.06	.50	.20
19	5.0	4.1	3.8	1.2	.90	4.0	13	14	.08	.03	.50	.20
20	5.0	4.1	3.8	1.2	1.0	4.5	12	13	.08	.02	.45	.20
21	5.9	4.1	3.6	1.1	1.1	5.0	11	7.6	.09	.02	.45	.25
22	6.0	4.2	3.6	1.1	1.2	5.5	11	7.1	.09	.02	.40	.25
23	6.1	4.2	3.4	1.1	1.3	6.0	11	6.5	.10	.02	.40	.25
24	6.4	4.2	3.4	1.1	1.3	8.5	10	6.2	.10	.02	.40	.25
25	5.9	4.3	3.3	1.0	1.3	13	9.6	5.8	.10	.02	.40	.25
26	5.7	4.3	3.2	1.0	1.5	15	9.6	5.4	.11	.02	.35	.30
27	5.4	4.2	3.0	1.0	2.0	47	9.5	5.0	.15	.02	.35	.30
28	5.2	4.0	2.8	1.0	3.0	84	8.8	5.3	.15	.02	.35	.30
29	5.2	3.8	2.7	1.0	3.5	86	7.5	5.3	.16	.02	.35	.30
30	5.7	3.8	2.7	1.0	---	64	7.6	5.0	1.0	.03	.35	.30
31	4.9	---	2.6	1.0	---	47	---	4.4	---	.04	.30	---
TOTAL	198.0	126.5	116.6	42.1	33.10	510.1	489.6	230.9	22.78	15.96	9.83	5.14
MEAN	6.39	4.22	3.76	1.36	1.14	16.5	16.3	7.45	.76	.51	.32	.17
MAX	9.9	4.9	4.5	2.5	3.5	86	39	14	3.3	3.8	.55	.30
MIN	4.9	3.7	2.6	1.0	.80	2.4	7.5	4.4	.08	.02	.05	.03
AC-FT	393	251	231	84	66	1010	971	458	45	32	19	10

CAL YR 1987 TOTAL 39842.9 MEAN 109 MAX 2840 MIN 2.6 AC-FT 79030
WTR YR 1988 TOTAL 1800.61 MEAN 4.92 MAX 86 MIN .02 AC-FT 3570

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
28...	1130	5.2	1430	--	9.0	4.0	--	--	--	--	--
NOV											
18...	0945	4.2	1900	--	4.5	0.5	--	--	--	--	--
JAN											
14...	1440	1.3	2210	--	-1.0	0.0	--	--	--	--	--
MAR											
01...	1310	3.3	970	--	12.0	0.0	--	--	--	--	--
APR											
12...	1105	16	1070	7.89	20.0	8.0	170	32	21	93	53
20...	1450	13	1140	--	13.0	9.0	--	--	--	--	--
JUN											
15...	1255	0.08	--	--	30.0	23.0	--	--	--	--	--
JUL											
19...	1000	0.03	1530	8.76	24.0	20.5	250	47	32	310	72

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
12...	3	11	220	150	11	0.10	16	442	464	19.1	0.60
JUL											
19...	9	10	620	260	46	0.50	12	1080	1140	0.0	1.47

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										
12...	2	330	240	1	52	130	0.1	1	2	270
JUL										
19...	17	840	20	<1	130	80	0.2	4	<1	550

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 mi^2, approximately.

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 ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.09	13.03	14.11	18.02	---	19.95	15.15	14.43	14.94	15.15	14.52	14.61
2	14.07	12.92	14.50	18.42	---	19.68	15.14	14.55	15.00	15.04	14.55	14.68
3	14.19	12.91	14.95	---	---	19.51	15.06	14.66	14.92	14.91	14.57	14.56
4	14.14	13.04	15.22	---	---	19.55	15.02	14.44	14.65	14.91	14.52	14.48
5	14.14	12.68	15.32	---	---	19.61	15.04	14.34	14.62	14.91	14.50	14.48
6	14.11	12.93	15.41	---	---	19.83	14.97	14.31	14.79	14.90	14.49	14.49
7	14.05	12.94	15.42	19.26	---	19.61	14.89	14.36	14.91	14.92	14.49	14.44
8	13.65	12.89	15.36	---	21.05	19.21	14.89	14.29	14.92	14.94	14.44	14.09
9	13.10	12.78	15.43	---	---	19.18	14.82	14.33	14.84	14.88	14.44	13.83
10	13.14	12.79	15.35	20.84	---	19.27	14.71	14.38	14.80	14.89	14.48	13.56
11	13.17	12.83	15.35	20.88	---	19.52	14.54	14.43	14.79	14.87	14.55	13.49
12	13.19	12.71	15.31	---	21.10	18.87	14.22	14.56	14.83	14.87	14.58	13.53
13	13.02	12.79	15.26	---	21.09	17.86	14.36	14.62	14.84	14.92	14.56	13.47
14	12.99	12.90	15.21	20.44	21.20	18.38	14.49	14.81	14.84	14.88	14.49	13.38
15	13.08	12.84	15.27	20.54	---	19.48	14.57	14.90	14.92	14.88	14.54	13.51
16	13.01	12.63	15.35	20.53	21.03	19.16	14.64	14.65	14.86	14.90	14.53	13.44
17	13.14	12.38	15.52	20.59	21.04	19.30	14.60	14.65	14.83	14.83	14.55	13.50
18	13.09	12.56	15.37	20.61	21.08	19.54	14.58	14.77	14.86	14.83	14.54	13.42
19	13.08	12.73	15.23	20.50	21.06	19.18	14.30	14.91	14.88	14.84	14.56	12.99
20	12.95	12.65	15.18	20.43	20.99	19.09	14.37	14.88	14.83	14.88	14.58	12.75
21	13.15	12.72	15.20	20.46	21.01	19.15	14.46	14.57	14.79	14.87	14.48	12.68
22	13.18	12.80	15.25	20.43	21.04	18.32	14.54	14.68	14.87	14.88	14.45	12.50
23	13.03	12.76	15.39	20.38	20.99	16.65	14.51	14.82	14.81	14.86	14.44	---
24	13.06	12.78	15.30	20.38	20.69	15.63	14.58	14.85	14.78	14.87	14.48	---
25	13.18	12.58	15.17	---	20.41	15.34	14.47	14.88	14.83	14.85	14.49	---
26	12.66	12.89	15.32	20.53	20.72	15.21	14.06	14.88	14.83	14.86	14.55	---
27	12.86	13.64	15.38	20.65	20.97	15.36	14.48	14.92	14.76	14.88	14.65	---
28	12.90	13.99	15.20	20.67	20.98	15.25	14.66	14.92	14.81	14.92	14.60	---
29	12.89	14.10	15.30	20.66	20.47	15.32	14.34	14.83	14.77	14.91	14.47	---
30	12.86	14.13	15.25	20.70	---	14.96	14.41	14.87	14.95	14.81	14.59	---
31	12.73	---	15.76	---	---	15.15	---	14.89	---	14.60	14.72	---
MEAN	13.29	12.94	15.25	---	---	18.13	14.63	14.66	14.84	14.89	14.53	---
MAX	14.19	14.13	15.76	---	---	19.95	15.15	14.92	15.00	15.15	14.72	---
MIN	12.66	12.38	14.11	---	---	14.96	14.06	14.29	14.62	14.60	14.44	---

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 mi^2, 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. 9 to Mar. 29. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--38 years, 47.1 ft^3/s, 34,120 acre-ft/yr; median of yearly mean discharges, 33 ft^3/s, 23,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft^3/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 ft^3/s, on basis of slope-area measurement at site 4 mi downstream.

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)
Mar. 27	1815	*45	a*3.31				

Minimum daily discharge, 1.0 ft^3/s, Jan. 25-27 and Feb. 6-10.
a - Backwater from ice.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	5.5	5.9	2.5	1.1	11	19	6.8	4.3	5.2	1.4	1.7
2	4.3	5.5	6.0	1.5	1.1	10	18	12	4.2	4.3	1.5	1.7
3	4.3	5.5	6.1	1.8	1.1	9.0	17	14	4.0	4.1	2.0	1.7
4	4.4	5.5	6.1	1.7	1.1	10	14	13	3.6	3.7	1.8	1.6
5	4.0	5.5	6.0	1.7	1.1	11	12	13	3.3	4.0	1.7	1.6
6	3.9	5.4	6.0	1.7	1.0	13	10	13	2.9	4.2	1.9	1.7
7	3.7	5.4	6.0	1.6	1.0	11	10	12	2.7	3.9	2.1	1.7
8	4.0	5.5	6.0	1.5	1.0	9.0	9.3	14	2.7	3.6	2.3	1.7
9	3.9	5.5	5.9	1.4	1.0	10	9.8	15	2.2	3.9	2.6	1.7
10	3.8	5.5	6.2	1.4	1.0	11	9.8	14	2.2	3.5	2.5	1.7
11	4.1	5.5	6.2	1.3	1.1	10	10	15	1.9	3.0	2.1	1.9
12	4.3	6.1	6.0	1.3	1.2	9.0	11	16	2.7	2.8	1.7	2.0
13	4.5	6.1	5.8	1.2	1.4	8.5	11	14	2.8	2.5	1.6	2.0
14	4.5	6.1	5.8	1.2	1.6	8.5	10	13	3.2	2.1	1.8	1.9
15	4.5	6.8	5.2	1.1	1.6	9.0	9.6	11	3.3	1.7	1.8	2.5
16	5.1	6.7	4.8	1.2	1.8	11	9.4	9.8	3.2	1.7	1.9	2.4
17	5.3	6.3	4.4	1.2	2.2	13	9.2	9.7	3.3	2.0	1.9	2.2
18	5.4	6.1	4.2	1.2	2.6	15	8.7	9.4	3.2	1.9	1.9	2.6
19	5.5	6.0	4.2	1.1	2.0	13	8.4	8.8	3.0	1.9	1.9	2.8
20	5.7	6.0	4.2	1.1	2.0	13	8.0	8.2	2.3	1.9	1.8	2.5
21	5.7	5.7	4.0	1.1	2.0	15	8.0	7.7	2.6	1.7	1.9	2.6
22	5.6	5.8	3.8	1.1	3.0	20	7.6	7.5	3.1	1.8	1.8	2.5
23	5.4	5.9	3.8	1.2	3.5	25	7.4	7.0	3.1	1.7	1.7	2.5
24	5.4	5.9	3.7	1.1	3.0	30	7.4	6.4	2.3	1.3	1.6	2.4
25	5.4	5.9	3.4	1.0	2.5	32	7.4	6.0	1.6	1.8	1.6	2.6
26	5.5	6.4	3.2	1.0	4.0	35	7.2	5.5	1.3	1.7	1.5	2.5
27	5.5	6.3	3.0	1.0	6.0	40	7.1	5.5	1.3	1.7	1.6	2.4
28	5.5	6.1	2.8	1.1	9.0	35	7.1	6.7	1.5	2.0	1.7	2.4
29	5.5	5.8	2.7	1.2	13	30	6.7	6.3	1.5	1.6	1.8	2.4
30	5.5	5.8	2.6	1.1	---	28	6.3	5.4	4.5	1.2	1.8	2.3
31	5.5	---	2.6	1.1	---	23	---	4.8	---	1.2	1.7	---
TOTAL	150.1	176.1	146.6	40.7	74.0	528.0	296.4	310.5	83.8	79.6	56.9	64.2
MEAN	4.84	5.87	4.73	1.31	2.55	17.0	9.88	10.0	2.79	2.57	1.84	2.14
MAX	5.7	6.8	6.2	2.5	13	40	19	16	4.5	5.2	2.6	2.8
MIN	3.7	5.4	2.6	1.0	1.0	8.5	6.3	4.8	1.3	1.2	1.4	1.6
AC-FT	298	349	291	81	147	1050	588	616	166	158	113	127

CAL YR 1987 TOTAL 14245.8 MEAN 39.0 MAX 1550 MIN 2.6 AC-FT 28260
WTR YR 1988 TOTAL 2006.9 MEAN 5.48 MAX 40 MIN 1.0 AC-FT 3980

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1100	4.1	1720	--	13.0	8.5	--	--	--	--	--
NOV											
20...	1250	5.8	1720	--	8.0	1.5	--	--	--	--	--
JAN											
06...	1135	1.7	2350	--	-14.0	0.5	--	--	--	--	--
FEB											
18...	1100	2.6	2000	--	3.0	0.5	--	--	--	--	--
29...	1515	13	1770	--	12.0	0.5	--	--	--	--	--
MAR											
16...	1725	11	1680	8.00	-3.0	0.5	370	69	48	250	59
28...	1635	42	1360	--	-2.5	1.0	--	--	--	--	--
APR											
12...	1135	11	1650	--	18.0	11.5	--	--	--	--	--
MAY											
10...	1205	14	2000	--	19.0	15.5	--	--	--	--	--
JUN											
20...	1430	2.0	2330	8.30	41.0	26.0	520	94	70	350	59
AUG											
09...	1115	2.6	1960	--	26.5	21.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
16...	6	12	280	630	9.7	0.30	5.6	1250	1200	37.1	1.70
JUN											
20...	7	9.6	390	870	15	0.50	6.9	1650	1650	8.69	2.24

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)
MAR										
16...	1	360	170	<1	31	110	0.4	1	1	970
JUN										
20...	2	500	30	<1	50	90	0.2	4	<1	1700

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND

LOCATION.--Lat 46°19'20", long 102°59'45", in NW1/4 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 Apr. 4. Records good except those for period of estimated daily discharges, which are poor.

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 observed, 6.2 ft^3/s, Mar. 2, gage height, 3.02 ft, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	5.0	.90	.10	.01	.00	.00	.00
2					.00	6.0	.80	1.0	.01	.00	.00	.00
3					.00	5.5	.75	1.5	.00	.00	.00	.00
4					.00	5.0	.70	.88	.00	.00	.00	.00
5					.00	4.0	.39	.52	.00	.00	.00	.00
6					.00	3.0	.45	1.1	.00	.00	.00	.00
7					.00	3.5	.45	.85	.00	.00	.00	.00
8					.00	2.5	.41	.50	.00	.00	.00	.00
9					.00	2.0	.36	.94	.00	.00	.00	.00
10					.00	1.5	.32	1.4	.00	.00	.00	.00
11					.00	1.0	.28	.93	.00	.00	.00	.00
12					.00	.85	.21	1.5	.00	.00	.00	.00
13					.00	.70	.16	1.9	.00	.00	.00	.00
14					.00	.55	.13	1.2	.00	.00	.00	.00
15					.00	.30	.12	1.4	.00	.00	.00	.00
16					.00	.15	.13	.80	.00	.00	.00	.00
17					.00	.00	.11	.38	.00	.00	.00	.00
18					.00	.00	.13	.29	.00	.00	.00	.00
19					.00	.25	.12	.27	.00	.00	.00	.00
20					.00	.50	.11	.26	.00	.00	.00	.00
21					.00	.75	.11	.17	.00	.00	.00	.00
22					.00	.75	.11	.11	.00	.00	.00	.00
23					.00	1.0	.18	.08	.00	.00	.00	.00
24					.00	.75	.22	.07	.00	.00	.00	.00
25					.00	.50	.12	.04	.00	.00	.00	.00
26					.00	.25	.08	.02	.00	.00	.00	.00
27					.50	.75	.12	.02	.00	.00	.00	.00
28					1.0	.50	.11	.03	.00	.00	.00	.00
29					2.5	.75	.12	.02	.00	.00	.00	.00
30					---	1.1	.11	.01	.00	.00	.00	.00
31					---	.95	---	.02	---	.00	.00	---
TOTAL					4.00	50.35	8.31	18.31	0.02	0.00	0.00	0.00
MEAN					.14	1.62	.28	.59	.001	.00	.00	.00
MAX					2.5	6.0	.90	1.9	.01	.00	.00	.00
MIN					.00	.00	.08	.01	.00	.00	.00	.00
AC-FT					7.9	100	16	36	.04	.0	.0	.0

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR											
02...	1640	6.2	2550	--	1.0	0.5	--	--	--	--	--
31...	1330	0.92	2520	7.70	8.0	4.5	810	160	100	340	47
APR											
12...	1655	0.17	3100	--	18.5	15.5	--	--	--	--	--
MAY											
12...	1755	2.3	4120	--	21.0	20.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
31...	5	11	280	1300	19	0.20	8.0	2080	2110	5.17	2.83

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)
MAR										
31...	2	600	50	<1	50	710	<1.0	1	<1	2300

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. 9 to Apr. 3. Records good except those for periods of estimated discharges, which are poor.

AVERAGE DISCHARGE.--38 years, 36.6 ft^3/s, 26,520 acre-ft/yr; median of yearly mean discharges, 30 ft^3/s, 21,700 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, 25,900 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)
Mar. 25	1445	----	a*5.42	Mar. 28	2030	*28	5.25

a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	3.0	4.0	2.0	1.0	14	21	3.8	3.7	4.0	.18	.41
2	2.1	3.0	4.0	1.0	1.5	15	20	8.5	3.1	3.6	.18	.41
3	2.2	3.1	4.1	.90	1.0	14	18	9.7	2.6	3.1	.22	.41
4	2.0	3.3	4.2	.70	1.0	14	17	8.2	2.3	2.8	.46	.39
5	2.0	3.1	4.2	.50	1.0	13	16	8.8	1.9	2.8	.76	.36
6	2.0	3.0	4.1	.80	1.5	13	13	9.1	1.3	2.4	.75	.41
7	1.8	3.0	4.2	.90	1.5	12	12	11	.93	1.8	.65	.41
8	1.8	3.0	4.2	.95	1.5	12	11	13	.82	1.2	.65	.39
9	2.0	3.0	4.0	.95	1.5	10	11	14	.82	.86	.65	.32
10	2.4	3.2	3.8	1.0	1.0	10	11	12	.69	.61	.65	.39
11	2.4	3.4	4.0	1.5	1.0	11	9.8	13	.51	.52	.61	.62
12	2.3	3.6	3.8	1.0	.50	9.5	8.5	15	.77	.47	.53	.76
13	2.2	3.6	4.0	1.0	.50	8.5	7.4	14	.85	.39	.65	.93
14	2.3	3.9	3.8	1.0	1.0	7.5	7.1	12	1.5	.32	.79	1.0
15	2.4	4.5	3.4	1.5	1.5	7.0	7.0	9.6	1.6	.32	.77	1.1
16	3.0	4.7	2.5	2.0	2.0	7.5	6.3	8.5	1.9	.39	.58	1.4
17	3.5	4.6	3.0	2.0	2.0	8.5	5.8	7.9	1.5	.60	.41	1.6
18	3.6	4.5	3.0	1.5	2.5	8.0	5.4	7.6	1.1	.82	.41	1.6
19	3.6	4.2	3.5	1.5	3.0	8.5	5.2	8.5	.77	.79	.51	1.6
20	3.8	4.0	3.0	1.0	3.5	9.0	5.1	7.7	.60	.65	.52	1.8
21	3.8	3.8	2.5	1.5	4.0	9.5	4.9	6.5	.45	.57	.43	1.6
22	3.6	4.0	3.0	2.0	3.5	11	4.8	5.5	.40	.41	.32	1.5
23	3.8	4.2	2.5	1.5	4.5	12	4.7	4.8	.41	.36	.30	1.3
24	3.9	4.2	1.5	1.0	5.5	14	4.6	4.1	.42	.25	.24	1.2
25	4.2	4.3	2.0	1.0	5.0	15	4.5	3.3	.32	.25	.20	1.0
26	3.7	4.2	2.5	1.0	7.5	18	4.5	3.3	.32	.25	.20	1.0
27	3.4	4.2	3.0	1.5	9.0	21	4.4	3.6	.29	.25	.23	1.0
28	3.1	4.2	2.5	1.5	12	23	4.2	3.7	.30	.25	.25	1.0
29	3.0	4.1	2.5	2.0	12	22	4.1	3.5	.27	.20	.32	1.0
30	3.0	4.1	3.0	1.5	---	21	3.8	5.7	2.4	.19	.38	1.0
31	3.0	---	2.5	1.5	---	20	---	4.7	---	.18	.41	---
TOTAL	88.1	113.0	102.3	39.70	93.00	398.5	262.1	250.6	34.84	31.60	14.21	27.91
MEAN	2.84	3.77	3.30	1.28	3.21	12.9	8.74	8.08	1.16	1.02	.46	.93
MAX	4.2	4.7	4.2	2.0	12	23	21	15	3.7	4.0	.79	1.8
MIN	1.8	3.0	1.5	.50	.50	7.0	3.8	3.3	.27	.18	.18	.32
AC-FT	175	224	203	79	184	790	520	497	69	63	28	55

CAL YR 1987 TOTAL 11212.8 MEAN 30.7 MAX 1310 MIN 1.5 AC-FT 22240
WTR YR 1988 TOTAL 1455.86 MEAN 3.98 MAX 23 MIN .18 AC-FT 2890

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1430	2.0	1720	--	15.0	10.0	--	--	--	--	--
NOV											
20...	1010	4.0	1970	--	2.5	1.0	--	--	--	--	--
JAN											
06...	1430	0.84	3010	--	-11.0	0.5	--	--	--	--	--
FEB											
18...	1415	2.7	1710	--	4.5	0.5	--	--	--	--	--
MAR											
01...	1030	14	2580	--	3.5	0.5	--	--	--	--	--
17...	1150	8.4	1750	7.90	2.0	0.5	500	87	69	220	48
29...	1050	22	1400	--	3.0	0.5	--	--	--	--	--
APR											
12...	1450	8.4	1680	--	21.0	13.5	--	--	--	--	--
MAY											
10...	1600	11	2130	--	26.0	18.0	--	--	--	--	--
JUN											
22...	0950	0.53	2400	8.30	33.0	24.0	560	64	97	380	59
AUG											
09...	1435	0.73	2330	--	36.0	24.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
17...	4	13	330	660	13	0.40	5.3	1320	1270	30.0	1.80
JUN											
22...	7	12	400	980	16	0.50	5.4	1840	1810	2.63	2.50

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)
MAR										
17...	1	470	80	<1	51	80	0.1	1	1	1300
JUN										
22...	3	670	40	<1	80	110	0.2	4	<1	1400

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 mi^2, 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. 21 to Mar. 26, June 30, and July 1. Records fair except those for periods of estimated daily discharge, which are poor.

AVERAGE DISCHARGE.--26 years (water years 1963-88), 102 ft^3/s, 73,900 acre-ft/yr; median of yearly mean discharges, 80 ft^3/s, 58,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft^3/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 ft^3/s, on basis of slope-area measurement 5 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 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	2300	*765	*4.57	No other peak greater than base discharge.			

No flow July 30 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	9.4	9.2	4.1	4.1	35	88	16	7.7	314	.00	.00
2	4.1	9.4	9.2	4.0	4.2	32	81	19	7.7	62	.00	.00
3	4.2	9.3	9.1	3.9	4.3	28	79	20	7.4	23	.00	.00
4	4.1	9.4	9.0	3.8	4.2	26	73	20	6.5	13	.00	.00
5	3.7	9.6	9.0	3.8	4.2	24	71	23	5.6	7.7	.00	.00
6	3.6	9.8	9.0	3.8	4.1	24	65	25	4.9	5.4	.00	.00
7	3.5	9.8	8.9	3.8	4.0	23	60	27	4.4	3.5	.00	.00
8	3.3	9.5	8.9	3.8	3.8	22	51	39	3.9	2.4	.00	.00
9	3.5	9.4	8.9	3.8	4.0	21	39	52	2.9	1.9	.00	.00
10	3.5	9.4	8.8	3.8	3.9	20	36	42	2.7	1.4	.00	.00
11	3.6	9.5	8.4	3.8	3.9	19	35	34	2.1	1.2	.00	.00
12	3.8	9.8	8.0	3.8	3.8	18	34	33	1.8	1.1	.00	.00
13	4.3	9.6	7.6	3.8	3.80	18	32	33	1.8	.96	.00	.00
14	4.2	9.4	7.4	3.9	3.9	20	29	30	10	.96	.00	.00
15	4.6	9.4	7.2	3.9	4.0	25	27	29	4.9	.61	.00	.00
16	4.9	9.4	7.0	3.9	4.5	30	27	28	3.1	.50	.00	.00
17	5.3	9.6	6.8	3.9	4.6	35	25	24	2.5	.40	.00	.00
18	5.5	9.6	6.6	3.9	4.8	40	24	22	2.1	.40	.00	.00
19	5.8	9.6	6.4	3.9	5.0	50	22	21	1.9	.24	.00	.00
20	5.9	9.9	6.2	3.9	5.5	60	21	20	1.6	.16	.00	.00
21	6.1	10	6.0	3.9	6.5	80	21	20	.96	.16	.00	.00
22	6.4	10	5.8	3.9	7.0	100	21	19	.80	.13	.00	.00
23	7.0	9.8	5.5	3.9	7.3	130	21	18	.55	.07	.00	.00
24	7.2	9.8	5.2	3.8	10	170	20	17	.40	.05	.00	.00
25	7.1	9.7	4.9	3.8	13	180	20	15	.20	.04	.00	.00
26	6.9	9.7	4.7	3.8	15	200	18	14	.11	.03	.00	.00
27	7.1	9.7	4.6	3.9	16	238	18	13	.07	.02	.00	.00
28	7.8	9.6	4.5	3.9	20	187	18	12	.04	.01	.00	.00
29	8.0	9.4	4.4	4.0	24	157	17	11	.03	.01	.00	.00
30	9.9	9.4	4.3	4.0	---	117	17	9.0	81	.00	.00	.00
31	11	---	4.2	4.1	---	102	---	8.7	---	.00	.00	---
TOTAL	170.1	287.9	215.7	120.3	203.40	2231	1110	713.7	169.66	441.35	0.00	0.00
MEAN	5.49	9.60	6.96	3.88	7.01	72.0	37.0	23.0	5.66	14.2	.00	.00
MAX	11	10	9.2	4.1	24	238	88	52	81	314	.00	.00
MIN	3.3	9.3	4.2	3.8	3.8	18	17	8.7	.03	.00	.00	.00
AC-FT	337	571	428	239	403	4430	2200	1420	337	875	.0	.0

CAL YR 1987 TOTAL 61212.7 MEAN 168 MAX 7790 MIN 3.3 AC-FT 121400
WTR YR 1988 TOTAL 5663.11 MEAN 15.5 MAX 314 MIN .00 AC-FT 11230

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
06...	1400	3.3	1220	--	12.0	10.0	--	--	--	--	--
NOV											
17...	1130	9.2	2300	--	4.5	0.5	--	--	--	--	--
JAN											
21...	1055	3.9	3840	--	-2.5	0.5	--	--	--	--	--
FEB											
23...	1150	7.3	2950	--	-4.5	0.5	--	--	--	--	--
29...	1420	24	2180	--	11.0	1.0	--	--	--	--	--
APR											
08...	1215	40	1480	8.66	9.0	12.0	400	68	56	190	50
MAY											
25...	1320	15	2410	--	28.5	21.0	--	--	--	--	--
JUN											
28...	1245	0.04	2430	--	36.0	31.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	4	9.2	230	590	9.8	0.30	1.0	1080	1070	117	1.47

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										
08...	1	370	20	1	57	30	<0.1	2	3	900

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. 27 to Mar. 26. Records fair except those for period of estimated daily discharges, which are poor. Some storage in several small lakes above station.

AVERAGE DISCHARGE.--54 years, 254 ft^3/s, 184,000 acre-ft/yr; median of yearly mean discharges, 200 ft^3/s, 145,000 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. 26	0345	a1,000	*bc5.95	No other peak greater than base discharge.			

Minimum daily discharge, 0.21 ft^3/s, Aug. 27-29.
a - About
b - Backwater from ice
c - Observed

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	38	24	10	3.1	120	740	62	31	616	.31	.25
2	17	36	28	8.2	3.1	136	730	55	31	426	.35	.24
3	17	34	28	6.9	3.1	137	570	70	27	215	.33	.22
4	18	33	28	5.5	3.0	145	300	89	26	129	.78	.25
5	13	31	24	4.1	3.0	160	260	75	21	91	1.7	.25
6	11	31	22	4.1	3.0	147	240	79	18	65	.96	.25
7	12	33	24	4.0	2.9	152	190	85	14	42	.66	.27
8	13	31	25	4.4	2.9	172	170	86	11	52	.59	.23
9	13	29	26	3.9	2.9	197	120	97	9.1	44	.51	.24
10	12	34	26	3.9	2.8	209	130	99	8.5	33	.48	.35
11	13	40	28	3.8	2.8	200	130	101	6.8	22	.43	.27
12	16	40	28	3.8	2.8	180	140	96	6.3	16	.33	.27
13	16	40	30	3.7	2.7	140	140	96	6.3	13	2.9	.33
14	18	44	30	3.7	2.7	130	140	87	17	9.8	.94	.44
15	17	42	30	3.7	2.7	172	130	85	19	7.3	.60	.60
16	17	40	30	3.6	2.6	178	130	88	57	6.3	.50	.75
17	19	36	32	3.6	2.6	191	120	84	30	4.9	.38	.81
18	19	42	32	3.6	2.6	191	120	74	16	3.6	.36	.77
19	22	50	32	3.5	2.5	197	110	72	11	3.3	.36	.54
20	23	38	32	3.5	2.5	200	110	70	8.2	3.0	.38	.59
21	25	42	32	3.5	2.5	200	100	48	6.0	2.5	.36	.69
22	26	38	32	3.5	2.4	230	100	48	4.9	1.9	.30	.69
23	26	44	31	3.4	2.4	300	80	46	3.9	.95	.27	.69
24	26	40	30	3.4	2.4	500	80	57	3.4	.69	.25	.67
25	24	40	29	3.3	2.3	750	70	50	3.0	.59	.25	.81
26	27	38	28	3.3	10	900	60	48	2.5	.50	.23	.71
27	29	36	27	3.2	20	850	60	44	2.0	.58	.21	.78
28	59	30	23	3.2	80	830	56	54	1.4	.49	.21	.82
29	52	26	19	3.2	100	810	59	44	1.1	.41	.21	.82
30	44	20	15	3.2	---	780	86	34	52	.38	.23	.88
31	38	---	11	3.2	---	770	---	33	---	.32	.25	---
TOTAL	699	1096	836	127.9	278.3	10274	5471	2156	454.4	1811.51	16.62	15.48
MEAN	22.5	36.5	27.0	4.13	9.60	331	182	69.5	15.1	58.4	.54	.52
MAX	59	50	32	10	100	900	740	101	57	616	2.9	.88
MIN	11	20	11	3.2	2.3	120	56	33	1.1	.32	.21	.22
AC-FT	1390	2170	1660	254	552	20380	10850	4280	901	3590	33	31

CAL YR 1987 TOTAL 162555 MEAN 445 MAX 22000 MIN 11 AC-FT 322400
WTR YR 1988 TOTAL 23236.21 MEAN 63.5 MAX 900 MIN .21 AC-FT 46090

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (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											
27...	1210	25	1030	8.64	7.5	4.5	4.2	12.2	94	K6	100
NOV											
24...	1255	38	1760	--	0.5	0.5	--	--	--	--	--
DEC											
22...	1550	32	2400	--	2.0	0.5	--	--	--	--	--
JAN											
27...	1230	3.2	2410	7.91	-1.0	0.5	1.9	3.4	24	K0	37
FEB											
25...	1040	2.3	4860	--	2.5	0.5	--	--	--	--	--
29...	1730	99	1960	--	10.5	0.5	--	--	--	--	--
APR											
05...	1040	257	1320	8.80	10.5	8.5	23	11.1	95	K33	380
27...	1405	62	1810	--	13.5	13.5	--	--	--	--	--
MAY											
27...	1030	41	2200	--	23.0	20.5	--	--	--	--	--
JUN											
28...	1025	1.6	2360	--	29.5	25.0	--	--	--	--	--
JUL											
28...	1210	0.40	1930	8.62	35.0	29.5	29	8.6	114	210	220

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 WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR-BONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	CAR-BONATE WATER WH IT FIELD MG/L AS CO3 (00447)
OCT										
27...	430	73	61	290	59	6	9.2	364	425	10
JAN										
27...	750	140	98	460	56	7	15	701	855	0
APR										
05...	370	64	50	170	50	4	8.3	207	230	11
JUL										
28...	270	34	44	370	75	10	6.0	446	481	31

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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT										
27...	710	14	0.40	5.9	1390	1380	1.89	95.3	<0.010	<0.100
JAN										
27...	1000	41	0.60	12	2200	2190	2.99	19.0	<0.010	0.210
APR										
05...	540	7.6	0.30	3.6	986	968	1.34	684	<0.010	<0.100
JUL										
28...	580	22	0.60	5.3	1360	1330	1.85	1.47	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, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHOROUS 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										
27...	0.020	0.030	0.04	0.70	0.020	0.010	0.010	<10	1	56
JAN										
27...	0.290	0.300	0.39	1.2	0.040	<0.010	<0.010	<10	1	78
APR										
05...	0.030	0.060	0.08	1.0	0.070	0.020	<0.010	<10	1	36
JUL										
28...	0.050	0.050	0.06	0.90	0.070	0.070	0.020	340	4	58

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 27...	<0.5	<1	<1	<3	<1	5	10	70	19	0.2
JAN 27...	<0.5	<1	1	<1	5	15	<5	120	190	<0.1
APR 05...	<0.5	<1	<1	<3	5	20	<5	45	9	0.2
JUL 28...	<0.5	<1	1	<3	4	7	<5	88	5	0.3

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 27...	<10	2	<1	<1.0	940	<6	17	31	2.1	93
JAN 27...	5	7	1	<1.0	1500	2	57	175	1.5	87
APR 05...	<10	5	1	1.0	800	<6	4	134	93	51
JUL 28...	<10	6	<1	<1.0	610	<6	5	--	--	--

06354500 BEAVER CREEK AT LINTON, ND

LOCATION.--Lat 46°15'27", long 100°13'58", on line between secs.17 and 18, T.132 N., R.76 W., Emmons County, Hydrologic Unit 10130104, on left bank 60 ft downstream from bridge on U.S. Highway 83, 0.7 mi south of railway station in Linton, and 1 mi upstream from Spring Creek.

DRAINAGE AREA.--717 mi^2, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1209: Drainage area. WSP 1239: 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 1,690.55 ft above National Geodetic Vertical Datum of 1929. Prior to June 18, 1958, nonrecording gage at site 60 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 5 to Mar. 21. Records fair except those for period of estimated daily discharge, which are poor.

AVERAGE DISCHARGE.--39 years, 41.3 ft^3/s, 29,920 acre-ft/yr; median of yearly mean discharges, 27 ft^3/s, 19,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,800 ft^3/s, Apr. 8, 1952, gage height, 17.50 ft; maximum gage height, 18.22 ft, Mar. 23, 1987; no flow at times in some 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)
Mar. 3	1400	ice jam	*8.06	Mar. 26	0815	*39	7.77

No flow July 12 to Aug. 1, Aug. 4-12, 15 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	6.5	3.9	2.3	.90	20	28	7.6	.75	.49	.00	.00
2	.93	6.6	4.0	2.1	.85	18	27	8.0	.52	.14	.04	.00
3	.93	6.5	4.0	2.0	.80	15	24	8.9	.46	.11	.01	.00
4	1.0	6.7	4.0	1.8	.75	17	20	9.2	.44	.10	.00	.00
5	1.1	6.0	4.0	1.3	.70	25	18	9.6	.40	.09	.00	.00
6	.97	5.5	4.0	1.0	.65	23	19	9.6	.37	.08	.00	.00
7	1.6	5.0	4.0	.80	.65	22	19	9.3	.36	.07	.00	.00
8	1.9	4.5	3.9	.60	.60	20	18	9.1	.32	.06	.00	.00
9	2.0	4.4	3.8	.45	.60	20	17	9.2	.30	.05	.00	.00
10	2.0	4.2	3.8	.30	.60	22	16	9.4	.28	.04	.00	.00
11	2.3	4.3	3.8	.35	.60	22	15	9.2	.32	.02	.00	.00
12	2.4	4.4	3.8	.40	.55	18	14	8.8	.37	.00	.00	.00
13	2.6	4.5	3.8	.45	.55	13	12	8.4	.31	.00	.15	.00
14	2.5	4.4	3.8	.50	.50	10	11	8.0	.37	.00	.02	.00
15	2.6	4.3	3.8	.55	.50	9.5	11	7.7	.24	.00	.00	.00
16	3.2	4.2	3.8	.60	.40	9.0	11	7.0	.22	.00	.00	.00
17	3.5	4.1	3.8	.55	.35	9.0	11	6.6	.22	.00	.00	.00
18	3.8	4.0	3.8	.50	.30	9.0	10	6.0	.22	.00	.00	.00
19	4.1	3.9	3.7	.55	.35	9.0	9.7	5.5	.21	.00	.00	.00
20	4.0	3.9	3.7	.60	.40	11	9.6	5.3	.19	.00	.00	.00
21	4.6	3.8	3.6	.65	.45	13	9.1	5.4	.18	.00	.00	.00
22	5.0	3.8	3.6	.65	.50	17	8.5	5.3	.19	.00	.00	.00
23	5.3	3.8	3.4	.70	.45	24	8.0	4.8	.17	.00	.00	.00
24	5.3	3.8	3.2	.75	.45	29	7.9	4.5	.16	.00	.00	.00
25	5.8	3.8	3.0	.80	.40	32	7.8	3.9	.16	.00	.00	.00
26	6.0	3.8	2.8	.80	.50	36	7.6	3.3	.14	.00	.00	.00
27	6.0	3.8	2.7	.75	1.0	32	7.4	2.8	.13	.00	.00	.00
28	6.0	3.7	2.6	.75	10	34	7.4	2.7	.13	.00	.00	.00
29	5.9	3.7	2.6	.80	25	28	7.4	2.3	.11	.00	.00	.00
30	5.9	3.8	2.5	.90	---	30	7.3	1.6	.29	.00	.00	.00
31	6.3	---	2.4	.95	---	28	---	1.1	---	.00	.00	---
TOTAL	106.33	135.7	109.6	26.20	50.35	624.5	398.7	200.1	8.53	1.25	0.22	0.00
MEAN	3.43	4.52	3.54	.85	1.74	20.1	13.3	6.45	.28	.040	.007	.00
MAX	6.3	6.7	4.0	2.3	25	36	28	9.6	.75	.49	.15	.00
MIN	.80	3.7	2.4	.30	.30	9.0	7.3	1.1	.11	.00	.00	.00
AC-FT	211	269	217	52	100	1240	791	397	17	2.5	.4	.0

CAL YR 1987 TOTAL 36963.98 MEAN 101 MAX 6300 MIN .63 AC-FT 73320
WTR YR 1988 TOTAL 1661.48 MEAN 4.54 MAX 36 MIN .00 AC-FT 3300

06354500 BEAVER CREEK AT LINTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
07...	1000	1.7	1150	--	5.0	4.0	--	--	--	--	--
NOV											
19...	1100	3.9	1570	--	-1.0	0.0	--	--	--	--	--
JAN											
20...	1130	0.62	1500	--	-10.0	0.5	--	--	--	--	--
FEB											
22...	1100	0.48	1340	--	-2.5	0.5	--	--	--	--	--
MAR											
01...	1030	20	860	--	4.0	1.0	--	--	--	--	--
31...	1130	34	680	--	2.0	1.5	--	--	--	--	--
APR											
11...	1015	15	785	8.44	11.5	8.5	250	57	27	79	39
MAY											
23...	1040	5.7	1130	--	19.0	17.5	--	--	--	--	--
JUN											
27...	0915	0.10	1160	--	26.5	21.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
11...	2	11	260	180	7.2	0.20	9.1	547	530	22.2	0.74

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										
11...	2	290	20	1	100	50	0.1	1	2	320

06354988 BOWMAN-HALEY LAKE NEAR HALEY, ND

LOCATION.--Lat 45°59'06", long 103°14'43", in NE1/4 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 mi^2, 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.

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, 17,080 acre-ft, Apr. 4, elevation, 2,753.79 ft; minimum, 13,540 acre-ft, Sept. 30, elevation, 2,751.34 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,753.73	16,990	--
Oct. 31	*2,753.42	16,510	-480
Nov. 30	2,753.39	16,460	-50
Dec. 31	2,753.35	16,400	-60
CAL YR 1987	-	-	-2,880
Jan. 31	2,753.34	16,380	-20
Feb. 29	2,753.40	16,480	+100
Mar. 31	2,753.78	17,070	+590
Apr. 30	2,753.59	16,770	-300
May 31	2,753.55	16,710	-60
June 30	2,753.09	16,000	-710
July 31	2,752.32	14,880	-1,120
Aug. 31	2,751.85	14,220	-660
Sept. 30	2,751.34	13,540	-680
WTR YR 1988	-	-	-3,450

* - Estimated

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: Dec. 13 to Mar. 29 and Sept. 19-30. Records fair except those for periods of estimated daily discharge, and beaver activity period of Sept. 19-30, which are poor. Flow regulated since August 1966 by Bowman-Haley Lake (station 06354988) 8 mi upstream.

AVERAGE DISCHARGE.--52 years (water years 1908-17, 1946-88), 26.8 ft^3/s, 19,400 acre-ft/yr; median of yearly mean discharges, 21 ft^3/s, 15,200 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, 4.3 ft^3/s, Mar. 30, gage height, 4.30 ft; maximum gage height, 4.72 ft, Jan. 27, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.6	1.3	.10	.00	3.3	2.6	1.1	1.1	.49	2.0	.07
2	1.5	1.6	1.2	.05	.00	3.0	2.4	1.2	1.0	.49	2.2	.07
3	1.4	1.6	1.1	.05	.00	2.5	2.2	1.3	1.0	.55	2.2	.09
4	1.3	1.6	1.1	.00	.00	2.5	2.1	1.4	1.0	.40	2.2	.09
5	1.3	1.6	1.1	.00	.00	2.1	1.8	1.5	1.0	.39	2.2	.09
6	1.3	1.7	1.1	.00	.00	2.2	1.6	1.4	1.0	.39	1.7	.09
7	1.3	1.8	1.1	.00	.00	2.3	1.6	1.4	1.0	.38	.69	.11
8	1.2	1.7	1.1	.00	.00	2.2	1.6	1.5	.94	.31	.36	.12
9	1.4	1.6	1.1	.00	.00	2.0	1.6	1.5	.94	.24	.48	.12
10	1.3	1.6	1.1	.00	.00	1.9	1.6	1.5	.85	.24	.35	.12
11	1.3	1.6	1.1	.00	.00	2.2	1.6	1.6	.67	.19	.15	.13
12	1.4	1.6	1.1	.00	.00	1.6	1.6	1.4	.17	.13	.16	.15
13	1.5	1.6	1.1	.00	.00	1.4	1.6	1.2	.09	.09	.19	.15
14	1.6	1.6	1.0	.00	.00	1.2	1.3	1.2	.09	.06	.19	.15
15	1.5	1.6	1.0	.00	.00	1.0	1.3	1.1	.09	.04	.19	.15
16	1.9	1.6	1.0	.00	.00	.75	1.3	1.1	.09	.04	.19	.19
17	1.9	1.6	.90	.00	.00	.50	1.3	1.1	.12	.03	.24	.19
18	1.8	1.6	.90	.00	.00	.50	1.3	1.1	.20	.02	.24	.19
19	1.6	1.6	.80	.00	.00	1.0	1.3	1.1	.40	.01	.22	.18
20	1.6	1.6	.80	.00	.00	1.5	1.3	1.1	.56	.01	.17	.18
21	1.6	1.6	.70	.00	.05	2.5	1.3	1.1	.52	.01	.14	.18
22	1.6	1.6	.70	.00	.10	3.0	1.3	1.1	.40	.02	.11	.17
23	1.6	1.5	.60	.00	.50	2.5	1.3	1.1	.26	.05	.08	.17
24	1.6	1.5	.60	.00	.75	2.0	1.3	1.1	.14	.05	.06	.19
25	1.6	1.3	.50	.00	1.0	1.5	1.3	1.1	.09	.08	.06	.19
26	1.6	1.3	.30	.00	1.5	1.5	1.3	1.1	.09	.14	.07	.18
27	1.6	1.3	.30	.00	2.0	2.5	1.2	1.1	.07	.36	.05	.19
28	1.5	1.3	.20	.00	2.5	2.0	1.1	1.1	.06	.87	.05	.20
29	1.6	1.3	.20	.00	3.0	2.7	1.1	1.1	.04	1.1	.05	.25
30	1.6	1.3	.20	.00	---	3.4	1.1	1.1	.25	1.5	.07	.26
31	1.6	---	.15	.00	---	3.4	---	1.1	---	1.8	.07	---
TOTAL	47.1	46.4	25.45	0.20	11.40	62.65	45.3	37.9	14.23	10.48	17.13	4.61
MEAN	1.52	1.55	.82	.006	.39	2.02	1.51	1.22	.47	.34	.55	.15
MAX	1.9	1.8	1.3	.10	3.0	3.4	2.6	1.6	1.1	1.8	2.2	.26
MIN	1.2	1.3	.15	.00	.00	.50	1.1	1.1	.04	.01	.05	.07
AC-FT	93	92	50	.4	23	124	90	75	28	21	34	9.1

CAL YR 1987 TOTAL 5942.75 MEAN 16.3 MAX 598 MIN .15 AC-FT 11790
WTR YR 1988 TOTAL 322.85 MEAN .88 MAX 3.4 MIN .00 AC-FT 640

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT											
08...	1055	1.3	2940	--	8.5	2.5	--	--	--	--	--
NOV											
18...	1345	1.6	2890	--	9.0	2.5	--	--	--	--	--
MAR											
01...	1425	3.3	2390	--	5.0	0.5	--	--	--	--	--
17...	1525	0.50	2120	--	2.0	0.5	--	--	--	--	--
29...	1500	2.7	1750	8.50	6.0	3.5	250	46	32	330	74
MAY											
12...	1315	1.4	2760	--	27.0	23.0	--	--	--	--	--
JUN											
21...	1345	0.56	3200	8.60	36.0	29.0	320	52	46	670	81
AUG											
21...	1410	0.48	3230	--	39.0	28.5	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
29...	9	5.1	310	660	8.8	0.50	2.0	1260	1280	9.05	1.71
JUN											
21...	17	11	500	1200	93	0.70	9.1	2380	2390	3.60	3.24

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)
MAR										
29...	1	740	10	1	30	40	0.2	2	<1	770
JUN										
21...	2	1400	30	<1	70	10	0.4	5	<1	1000

06439980 LAKE OAHE NEAR PIERRE, SD

LOCATION.--Lat 44°27'30", long 100°23'29", in NE1/4 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.

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.

REMARKS.--Reservoir is formed by an earthfill 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 ft3/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, 14,815,000 acre-ft, Sept. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 19,146,000 acre-ft, Oct. 1; minimum contents, 14,920,000 acre-ft, Sept. 30.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,607.77	19,154,000	-
Oct. 31	1,605.68	18,471,000	-683,000
Nov. 30	1,603.97	17,962,000	-509,000
Dec. 31	1,604.50	18,104,000	+142,000
CAL YR 1987	-	-	-381,000
Jan. 31	1,604.03	18,008,000	-96,000
Feb. 29	1,606.15	18,630,000	+622,000
Mar. 31	1,606.65	18,775,000	+145,000
Apr. 30	1,605.45	18,392,000	-383,000
May 31	1,604.70	18,173,000	-219,000
June 30	1,603.02	17,649,000	-524,000
July 31	1,600.25	16,938,000	-711,000
Aug. 31	1,597.04	16,016,000	-922,000
Sept. 30	1,597.78	14,920,000	-1,096,000
WTR YR 1988	-	-	-4,234,000

NOTE.--Lake frozen over Jan. 25 to Mar. 9.

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. 1 to Apr. 6. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--28 years (water years 1958-82, 1986 to current year), 4.20 ft^3/s, 3,040 acre-ft/yr; median of yearly mean discharges, 3.7 ft^3/s, 2,700 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.--Peaks greater than a base of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	1700	a*80	ab*3.70				

No flow for several months.
a - observed
b - ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.39	.39	.00	.00	3.5	9.2	.90	.30	.00	.00	.00
2	.14	.40	.37	.00	.00	2.7	10	1.2	.27	.00	.00	.00
3	.15	.48	.36	.00	.00	2.2	8.9	1.5	.22	.00	.00	.00
4	.16	.60	.35	.00	.00	2.1	7.6	1.4	.18	.00	.00	.00
5	.16	.58	.35	.00	.00	2.4	6.5	1.3	.17	.00	.00	.00
6	.16	.56	.35	.00	.00	2.3	5.2	1.3	.12	.00	.00	.00
7	.16	.54	.34	.00	.00	1.9	3.4	1.2	.07	.00	.00	.00
8	.17	.54	.33	.00	.00	1.7	3.3	.90	.0	.00	.00	.00
9	.17	.54	.32	.00	.00	1.8	3.2	.61	.00	.00	.00	.00
10	.17	.56	.30	.00	.00	1.2	2.6	.46	.00	.00	.00	.00
11	.18	.54	.28	.00	.00	.10	2.2	1.2	.00	.00	.00	.00
12	.19	.52	.22	.00	.00	.05	1.2	1.9	.00	.00	.00	.00
13	.20	.54	.20	.00	.00	.04	1.4	1.8	.00	.00	.00	.00
14	.21	.70	.18	.00	.00	.03	1.9	1.5	.00	.00	.00	.00
15	.22	.66	.17	.00	.00	.02	1.5	1.0	.00	.00	.00	.00
16	.23	.64	.16	.00	.00	.02	1.3	.53	.00	.00	.00	.00
17	.22	.62	.15	.00	.00	.02	1.1	.46	.00	.00	.00	.00
18	.24	.60	.14	.00	.00	.03	1.1	.69	.00	.00	.00	.00
19	.26	.57	.13	.00	.00	.05	1.1	.61	.00	.00	.00	.00
20	.26	.56	.12	.00	.00	.06	1.0	.37	.00	.00	.00	.00
21	.25	.56	.11	.00	.00	.50	1.3	.32	.00	.00	.00	.00
22	.27	.54	.10	.00	.00	1.0	3.2	.30	.00	.00	.00	.00
23	.28	.52	.09	.00	.00	2.0	1.2	.32	.00	.00	.00	.00
24	.30	.50	.08	.00	.01	10	.46	.34	.00	.00	.00	.00
25	.30	.49	.07	.00	.10	20	.53	.23	.00	.00	.00	.00
26	.32	.48	.06	.00	.50	40	1.1	.29	.00	.00	.00	.00
27	.33	.44	.06	.00	2.5	60	1.1	.56	.00	.00	.00	.00
28	.33	.43	.05	.00	4.0	45	.79	.60	.00	.00	.00	.00
29	.35	.42	.04	.00	3.7	38	1.9	.46	.00	.00	.00	.00
30	.36	.40	.03	.00	---	28	.87	.34	.00	.00	.00	.00
31	.37	---	.02	.00	---	15	---	.32	---	.00	.00	---
TOTAL	7.25	15.92	5.92	0.00	10.81	281.72	86.15	24.91	1.33	0.00	0.00	0.00
MEAN	.23	.53	.19	.00	.37	9.09	2.87	.80	.044	.00	.00	.00
MAX	.37	.70	.39	.00	4.0	60	10	1.9	.30	.00	.00	.00
MIN	.14	.39	.02	.00	.00	.02	.46	.23	.00	.00	.00	.00
AC-FT	14	32	12	.0	21	559	171	49	2.6	.0	.0	.0

CAL YR 1987 TOTAL 5008.49 MEAN 13.7 MAX 250 MIN .00 AC-FT 9930
WTR YR 1988 TOTAL 434.01 MEAN 1.19 MAX 60 MIN .00 AC-FT 861

06467600 JAMES RIVER NEAR MANFRED, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-60, 1962-64, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
NOV											
19...	0900	0.57	1140	8.22	0.0	0.5	3.5	13.0	89	--	310
MAR											
28...	1100	48	640	--	2.0	0.5	--	--	--	--	--
APR											
14...	0840	1.8	880	8.28	-3.0	5.0	2.7	9.6	74	4.4	270
MAY											
16...	1100	0.51	1110	8.35	15.0	10.5	1.1	10.0	89	2.4	310

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)
NOV											
19...	71	33	130	47	3	8.2	403	170	15	707	669
APR											
14...	56	31	95	42	3	11	296	180	11	580	562
MAY											
16...	60	38	150	51	4	7.8	465	170	14	751	720

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, 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, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
NOV										
19...	0.96	1.09	8	--	<0.010	--	<0.100	--	<0.010	--
APR										
14...	0.79	2.79	40	<0.010	<0.010	<0.100	<0.100	0.030	0.030	1.5
MAY										
16...	1.03	1.05	1	<0.010	<0.010	<0.100	<0.100	0.030	0.090	1.0

DATE	NITRO-GEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
NOV										
19...	0.50	--	0.050	--	0.039	--	1	310	--	2
APR										
14...	0.60	0.130	0.080	0.063	0.052	2	2	230	2	<1
MAY										
16...	0.70	0.260	0.230	0.226	0.204	4	4	410	<1	<1

06467600 JAMES RIVER NEAR MANFRED, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
NOV 19...	<1	--	46	<5	--	82	<0.1	--	<1	8
APR 14...	1	280	120	<5	90	67	0.2	<1	<1	<3
MAY 16...	<1	210	44	<5	100	78	0.6	<1	<1	5

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)
NOV 19...	--	--	--	--	--	--	--	71	0.11	73
APR 14...	14	<0.010	<0.01	5.60	0.400	7.5	1100	5	0.02	100
MAY 16...	15	<0.010	<0.01	1.00	<0.100	17	1200	29	0.04	79

06468170 JAMES RIVER NEAR GRACE CITY, ND

LOCATION.--Lat 47°33'29", long 98°51'45", in NW¼NW¼NW¼ sec.17, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank on downstream 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: Oct. 1 to Nov. 4 and Nov. 26 to Apr. 13. Records good except for periods of estimated discharge, which are poor.

AVERAGE DISCHARGE.--20 years, 31.4 ft^3/s, 22,750 acre-ft/yr; median of yearly mean discharges, 26 ft^3/s, 18,800 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)
Mar. 26	1045	*150	a*6.79				

No flow for many days.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	.73	1.0	.00	.00	20	34	8.6	1.5	.30	.00	.00
2	3.2	.72	.95	.00	.00	15	33	6.7	2.2	.18	.00	.00
3	3.0	.71	.95	.00	.00	13	34	5.1	2.7	.18	.01	.00
4	2.8	.70	.90	.00	.00	10	33	4.8	3.0	.20	.00	.00
5	2.6	.75	.85	.00	.00	12	31	5.3	2.9	.24	.00	.00
6	2.4	.84	.80	.00	.00	15	30	7.3	2.8	.24	.00	.00
7	2.3	.88	.75	.00	.00	20	30	6.3	2.0	.18	.00	.00
8	2.2	.90	.70	.00	.00	30	29	4.5	1.9	.06	.00	.00
9	2.1	.89	.65	.00	.00	40	29	3.7	1.5	.04	.00	.00
10	2.0	.90	.60	.00	.00	35	28	3.7	1.1	.00	.00	.00
11	1.9	.87	.55	.00	.00	30	28	3.4	.87	.00	.00	.00
12	1.8	.76	.50	.00	.00	20	27	2.7	.75	.00	.00	.00
13	1.7	.76	.45	.00	.00	15	27	2.8	.83	.00	.00	.00
14	1.6	.80	.40	.00	.00	12	26	2.7	.69	.00	.00	.00
15	1.5	.85	.35	.00	.00	10	27	1.5	.62	.00	.00	.00
16	1.5	.80	.30	.00	.00	9.0	27	1.8	.72	.00	.00	.00
17	1.4	1.1	.25	.00	.00	10	25	3.2	.80	.00	.00	.00
18	1.3	1.2	.20	.00	.00	12	24	1.8	.73	.00	.00	.00
19	1.2	.96	.16	.00	.00	13	20	1.4	.57	.00	.00	.07
20	1.1	.90	.14	.00	.00	12	19	1.5	.56	.00	.00	.00
21	1.0	.90	.12	.00	.00	11	17	1.6	.78	.00	.00	.00
22	.95	.90	.10	.00	.00	10	16	1.8	.56	.00	.00	.00
23	.90	.90	.08	.00	.00	20	14	2.1	1.0	.00	.00	.00
24	.85	1.1	.06	.00	.00	50	13	2.5	.83	.00	.00	.00
25	.80	1.1	.04	.00	.00	100	11	1.8	.66	.00	.00	.00
26	.79	1.1	.03	.00	.10	120	10	1.2	.66	.00	.00	.01
27	.78	1.1	.02	.00	1.0	60	9.5	.98	.66	.00	.00	.00
28	.77	1.6	.01	.00	10	45	8.9	1.1	.51	.00	.00	.00
29	.76	1.0	.01	.00	30	40	9.0	1.6	.54	.00	.00	.00
30	.75	1.0	.01	.00	---	45	8.7	1.6	.46	.00	.00	.02
31	.74	---	.00	.00	---	36	---	1.6	---	.00	.00	---
TOTAL	49.99	27.72	11.93	0.00	41.10	890.0	678.1	96.68	35.40	1.62	0.01	0.10
MEAN	1.61	.92	.38	.00	1.42	28.7	22.6	3.12	1.18	.052	.000	.003
MAX	3.3	1.6	1.0	.00	30	120	34	8.6	3.0	.30	.01	.07
MIN	.74	.70	.00	.00	.00	9.0	8.7	.98	.46	.00	.00	.00
AC-FT	99	55	24	.0	82	1770	1350	192	70	3.2	.02	.2

CAL YR 1987 TOTAL 18560.21 MEAN 50.8 MAX 1250 MIN .00 AC-FT 36810
WTR YR 1988 TOTAL 1832.65 MEAN 5.01 MAX 120 MIN .00 AC-FT 3640

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
NOV 18...	1400	1.2	1380	8.62	2.0	2.5	2.3	14.4	105	--	300
MAR 28...	1600	41	500	--	5.0	0.5	--	--	--	--	--
APR 13...	1600	27	670	8.40	11.0	10.5	3.4	11.8	104	6.0	230
MAY 17...	0930	2.3	960	8.65	14.0	12.5	1.5	10.6	99	2.4	300
JUL 07...	1330	0.15	1550	9.23	25.0	24.0	6.4	6.2	73	--	170

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)
NOV 18...	53	41	210	59	5	16	494	190	63	893	870
APR 13...	45	29	62	35	2	11	237	120	16	449	425
MAY 17...	54	39	110	44	3	10	352	150	28	646	602
JUL 07...	20	30	290	77	10	10	392	290	110	1020	987

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, 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)
NOV 18...	1.21	2.89	11	--	<0.010	--	<0.100	--	0.020	--
APR 13...	0.61	32.2	39	<0.010	<0.010	<0.100	<0.100	0.020	0.030	1.1
MAY 17...	0.88	3.96	<1	<0.010	<0.010	<0.100	<0.100	0.030	0.050	1.1
JUL 07...	1.39	0.41	23	--	0.020	--	0.280	--	0.310	--

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
NOV 18...	0.90	--	0.070	--	0.042	--	3	260	--	1
APR 13...	1.0	0.170	0.080	0.061	0.047	1	2	100	1	<1
MAY 17...	1.0	0.140	0.120	0.100	0.034	4	3	160	1	<1
JUL 07...	2.8	--	0.180	--	0.099	--	5	290	--	<1

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
NOV 18...	<1	--	18	<5	--	33	<0.1	--	<1	4
APR 13...	1	150	31	<5	210	19	0.1	6	<1	11
MAY 17...	1	120	20	<5	70	41	0.2	<1	<1	14
JUL 07...	1	--	35	<5	--	110	0.8	--	<1	4

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)
NOV 18...	--	--	--	--	--	--	--	59	0.19	81
APR 13...	17	<0.010	<0.01	4.90	0.700	14	1200	5	0.37	97
MAY 17...	18	<0.010	<0.01	0.700	<0.100	6.9	1200	15	0.09	62
JUL 07...	--	--	<0.01	--	--	--	--	21	0.01	96

06468190 JUANITA LAKE TRIBUTARY NEAR GRACE CITY, ND

LOCATION.--Lat 47°32'54", long 98°45'31", in SW¼NE¼SE¼ sec.13, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank 1,000 ft upstream from Lake Juanita, 2 mi east of Grace City.

DRAINAGE AREA.--94 mi^2, approximately, of which about 54 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year. Seasonal records only.

GAGE.--Water-stage recorder. Datum of gage is 1,460.00 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 25 to Apr. 1 and Apr. 18 to June 5. Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 204 ft^3/s, Apr. 2, 1987, gage height, 20.85 ft; no flow for several months each year.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, about 40 ft^3/s, Mar. 23, gage height, 19.76 ft, backwater from ice; maximum gage height, 19.79 ft, Mar. 12, backwater from ice; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	1.5	1.2	2.2	.00	.00	.00	.00
2					.00	.80	1.1	2.0	.00	.00	.00	.00
3					.00	.50	.92	1.7	.00	.00	.00	.00
4					.00	.40	.73	1.4	.00	.00	.00	.00
5					.00	.50	.73	1.1	.00	.00	.00	.00
6					.00	1.0	1.6	.90	.00	.00	.00	.00
7					.00	.80	1.5	.80	.00	.00	.00	.00
8					.00	.60	1.4	.70	.00	.00	.00	.00
9					.00	.50	.97	.60	.00	.00	.00	.00
10					.00	.40	.97	.60	.00	.00	.00	.00
11					.00	.30	.92	.55	.00	.00	.00	.00
12					.00	.25	1.2	.55	.00	.00	.00	.00
13					.00	.20	1.1	.50	.00	.00	.00	.00
14					.00	.15	.88	.50	.00	.00	.00	.00
15					.00	.12	1.7	.50	.00	.00	.00	.00
16					.00	.10	1.8	.50	.00	.00	.00	.00
17					.00	.10	1.8	.45	.00	.00	.00	.00
18					.00	.10	1.6	.40	.00	.00	.00	.00
19					.00	.10	2.2	.35	.00	.00	.00	.00
20					.00	.30	2.5	.30	.00	.00	.00	.00
21					.00	1.0	2.0	.25	.00	.00	.00	.00
22					.00	5.0	1.8	.20	.00	.00	.00	.00
23					.00	30	1.6	.18	.00	.00	.00	.00
24					.00	35	1.5	.16	.00	.00	.00	.00
25					.10	33	1.4	.12	.00	.00	.00	.00
26					.20	30	1.2	.10	.00	.00	.00	.00
27					.50	20	1.1	.08	.00	.00	.00	.00
28					.80	8.5	.90	.06	.00	.00	.00	.00
29					1.0	6.0	2.0	.05	.00	.00	.00	.00
30					---	3.5	2.5	.04	.00	.00	.00	.00
31					---	1.5	---	.02	---	.00	.00	---
TOTAL					2.60	182.22	42.82	17.86	0.00	0.00	0.00	0.00
MEAN					.090	5.88	1.43	.58	.00	.00	.00	.00
MAX					1.0	35	2.5	2.2	.00	.00	.00	.00
MIN					.00	.10	.73	.02	.00	.00	.00	.00
AC-FT					5.2	361	85	35	.0	.0	.0	.0

06468190 JUANITA LAKE TRIBUTARY NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
MAR											
28...	1440	8.5	490	--	5.0	1.5	--	--	--	--	--
APR											
06...	1700	1.5	450	8.25	20.0	6.0	0.70	10.0	80	2.7	180
13...	1340	1.2	580	--	9.0	10.0	--	--	--	--	--
MAY											
17...	1100	0.47	910	8.25	20.0	13.0	0.60	10.1	95	1.6	370

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)
APR											
06...	41	19	29	25	1	7.0	172	54	17	292	270
MAY											
17...	77	43	65	27	2	6.2	361	110	37	589	555

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, 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										
06...	0.40	1.19	<1	<0.010	<0.010	<0.100	<0.100	0.060	0.040	0.90
MAY										
17...	0.80	0.75	<1	<0.010	<0.010	<0.100	<0.100	0.030	0.060	0.80

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
APR										
06...	0.70	0.070	0.040	0.023	0.015	1	1	30	<1	<1
MAY										
17...	0.70	0.080	0.070	0.054	0.054	2	4	40	1	<1

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)
APR										
06...	<1	120	70	<5	90	84	0.3	<1	<1	<3
MAY										
17...	<1	90	19	<5	30	25	0.1	<1	<1	5

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)
APR										
06...	11	<0.010	<0.01	2.50	0.300	14	1200	4	0.01	85
MAY										
17...	17	<0.010	<0.01	<0.300	<0.100	17	1100	9	0.01	54

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

LOCATION.--Lat 47°23'59", long 98°47'50", in SW¼SW¼SW¼ sec.2, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160003, on right bank 30 ft upstream from bridge on county road 8 mi northwest of Kensal.

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.

REMARKS.--Estimated daily discharges: Oct. 1 to July 1. Records 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)
Mar. 28	----	*a180	unknown				

a - Estimated
No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	2.0	2.1	.45	.00	20	53	15	4.0	.05	.00	.00
2	6.6	1.9	2.2	.40	.00	18	50	14	4.4	.00	.00	.00
3	6.4	1.9	2.3	.35	.00	17	47	13	4.1	.00	.00	.00
4	6.0	1.8	2.4	.33	.00	15	47	15	4.1	.00	.00	.00
5	5.6	1.8	2.5	.30	.00	23	38	17	4.2	.00	.00	.00
6	5.5	1.8	2.6	.27	.00	30	32	15	4.1	.00	.00	.00
7	5.4	1.8	2.7	.24	.00	20	34	13	4.0	.00	.00	.00
8	5.3	1.7	2.8	.20	.00	19	40	14	4.0	.00	.00	.00
9	5.2	1.7	2.9	.15	.00	40	47	15	3.5	.00	.00	.00
10	5.0	1.7	3.0	.12	.00	35	45	12	3.3	.00	.00	.00
11	4.9	1.7	2.8	.10	.00	30	42	10	3.0	.00	.00	.00
12	4.8	1.6	2.7	.06	.00	25	35	9.5	3.0	.00	.00	.00
13	4.7	1.6	2.5	.04	.00	15	31	9.0	3.3	.00	.00	.00
14	4.6	1.6	2.3	.02	.00	14	31	8.0	3.3	.00	.00	.00
15	4.5	1.6	2.2	.00	.00	13	30	7.0	3.5	.00	.00	.00
16	4.3	1.6	2.1	.00	.00	12	26	6.7	3.4	.00	.00	.00
17	4.1	1.6	2.0	.00	.00	12	25	6.0	3.3	.00	.00	.00
18	3.9	1.6	1.8	.00	.00	20	27	5.5	3.0	.00	.00	.00
19	3.8	1.6	1.5	.00	.00	19	28	5.0	2.5	.00	.00	.00
20	3.7	1.6	1.4	.00	.00	17	26	4.9	2.0	.00	.00	.00
21	3.5	1.6	1.3	.00	.00	20	26	4.8	1.8	.00	.00	.00
22	3.3	1.6	1.2	.00	.00	25	23	4.7	1.4	.00	.00	.00
23	3.1	1.6	1.2	.00	.00	35	21	4.6	1.0	.00	.00	.00
24	3.0	1.7	1.1	.00	.00	50	21	4.5	1.0	.00	.00	.00
25	2.8	1.7	.80	.00	.05	65	19	4.5	.90	.00	.00	.00
26	2.6	1.8	.70	.00	.20	90	19	4.4	.80	.00	.00	.00
27	2.4	1.8	.70	.00	2.0	130	18	4.3	.60	.00	.00	.00
28	2.2	1.9	.65	.00	10	150	17	4.6	.40	.00	.00	.00
29	2.1	1.9	.60	.00	23	60	17	4.5	.25	.00	.00	.00
30	2.0	2.0	.55	.00	---	58	16	4.0	.15	.00	.00	.00
31	2.0	---	.50	.00	---	56	---	3.8	---	.00	.00	---
TOTAL	130.1	51.8	56.10	3.03	35.25	1153	931	263.3	78.30	0.05	0.00	0.00
MEAN	4.20	1.73	1.81	.098	1.22	37.2	31.0	8.49	2.61	.002	.00	.00
MAX	6.8	2.0	3.0	.45	23	150	53	17	4.4	.05	.00	.00
MIN	2.0	1.6	.50	.00	.00	12	16	3.8	.15	.00	.00	.00
AC-FT	258	103	111	6.0	70	2290	1850	522	155	.1	.0	.0

CAL YR 1987 TOTAL 21431.31 MEAN 58.7 MAX 1400 MIN .08 AC-FT 42510
WTR YR 1988 TOTAL 2701.93 MEAN 7.38 MAX 150 MIN .00 AC-FT 5360

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
NOV 18...	1230	1.6	960	8.35	2.0	2.5	5.3	10.8	78	--	360	65
JAN 07...	1000	0.24	1570	7.88	-15.0	0.5	4.7	--	--	--	600	110
APR 13...	1100	31	440	8.58	7.0	9.0	6.0	11.4	97	5.6	160	33
MAY 16...	1700	6.7	860	8.48	22.0	16.0	8.4	13.0	130	6.8	300	59
AUG 24...	1000	0.0	1210	8.65	20.0	17.0	--	7.1	73	--	--	--

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)	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 18...	48	83	32	2	14	374	140	20	627	595	0.85	2.71
JAN 07...	79	150	34	3	21	570	240	35	1040	978	1.41	0.67
APR 13...	18	38	33	1	7.7	160	70	11	280	274	0.38	23.8
MAY 16...	37	80	36	2	9.6	334	130	20	558	536	0.76	10.1

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 18...	14	--	<0.010	--	<0.100	--	0.020	--	1.1	--	0.020	--
JAN 07...	15	--	0.010	--	<0.100	--	0.360	--	1.8	--	0.080	--
APR 13...	38	<0.010	<0.010	<0.100	<0.100	0.020	0.020	1.8	0.60	0.120	0.020	0.018
MAY 16...	16	<0.010	<0.010	<0.100	<0.100	0.020	0.040	1.1	0.90	0.120	0.030	0.037

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 18...	<0.001	--	2	150	--	<1	<1	--	55	<5	--	44
JAN 07...	0.037	--	2	210	--	<1	2	--	49	<5	--	220
APR 13...	0.002	2	1	70	1	<1	1	280	40	<5	120	26
MAY 16...	0.009	3	3	170	<1	<1	<1	460	10	<5	480	93

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	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)
NOV 18...	0.2	--	<1	9	--	--	--	--	--	--	--	56
JAN 07...	0.2	--	<1	14	--	--	--	--	--	--	--	208
APR 13...	0.1	<1	<1	11	11	<0.010	<0.01	11.0	0.600	22	1200	12
MAY 16...	0.1	1	<1	6	20	<0.010	<0.01	19.0	2.70	28	1200	27
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALDRIN, DIS-SOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AME-TRYNE TOTAL (82184)	ATRA-ZINE, TOTAL (UG/L) (39630)	GUTHION TOTAL (UG/L) (39580)	SEVIN, TOTAL (UG/L) (39750)	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)
NOV 18...	0.24	73	--	--	--	--	--	--	--	--	--	--
JAN 07...	0.13	96	--	--	--	--	--	--	--	--	--	--
APR 13...	1.0	100	--	--	--	--	--	--	--	--	--	--
MAY 16...	0.50	99	<0.01	<0.010	<0.10	<0.10	<0.10	<0.50	<0.1	<0.1	<0.10	<0.01
AUG 24...	--	--	<0.01	<0.010	<0.10	<0.10	<0.10	<0.50	<0.1	<0.1	<0.10	<0.01

DATE	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)	DI-ELDRIN TOTAL (UG/L) (39380)[a]	DYPHO-NATE TOTAL (UG/L) (LC1336)	ENDO-SULFAN DISSOLV (UG/L) (82354)	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, DIS-SOLVED (UG/L) (39391)
MAY 16...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01
AUG 24...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.010	<0.01

DATE	ETHION DISSOLV (UG/L) (82346)	ENDRIN, TOTAL (UG/L) (39390)	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)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, DIS-SOLVED (UG/L) (39532)	MALA-THION, TOTAL (UG/L) (39530)
MAY 16...	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01
AUG 24...	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01

DATE	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)	MIREX, DIS-SOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	METHYL TRI-THION, TOTAL (UG/L) (39790)	METHYL-TRI-THION DISSOLV (UG/L) (82344)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)	PARA-THION, DIS-SOLVED (UG/L) (39542)
MAY 16...	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01
AUG 24...	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01

a - Lab Code. WATSTORE parameter code unavailable.

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	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 TOTAL (UG/L) (39023)	PROME-TONE TOTAL (UG/L) (39056)	PROME-TRYNE TOTAL (UG/L) (39057)	PROPHAM TOTAL (UG/L) (39052)	PRO-PAZINE TOTAL (UG/L) (39024)
MAY 16...	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1	<0.1	<0.5	<0.10
AUG 24...	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1	<0.1	<0.5	<0.10

DATE	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)	2,4-D, TOTAL (UG/L) (39730)	2,4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOX-APHENE, DIS-SOLVED (UG/L) (39401)	TOX-APHENE, TOTAL (UG/L) (39400)	TREF-LAN TOTAL (UG/L) [a](LC1337)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	TRI-THION DISSOLV (UG/L) (82342)	TOTAL TRI-THION (UG/L) (39786)
MAY 16...	<0.10	<0.1	0.05	<0.01	<0.01	<0.01	<1.0	<1	<0.50	<0.10	<0.01	<0.01
AUG 24...	<0.10	<0.1	<0.01	<0.01	<0.01	<0.01	<1.0	<1	<0.05	<0.10	<0.01	<0.01

a - Lab Code. WATSTORE parameter code unavailable.

06468300 KELLY CREEK BELOW NICCUM RESERVOIR NEAR BORDULAC, ND

LOCATION.--Lat 47°24'01", long 98°49'43", in SW¼SW¼SE¼ sec.4, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160001, on right bank 300 ft upstream from culvert on county road 6.5 mi east of Bordulac.

DRAINAGE AREA.--188 mi^2, approximately, of which about 77 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1985 to current year, seasonal records only.

GAGE.--Water-stage recorder. Elevation of gage is 1,460.00 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 25 to Mar. 28 and Mar. 31 to Apr. 6. Records fair except those for periods of estimated daily discharge, which are poor. Slight amount of regulation by Niccum Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 350 ft^3/s, Apr. 1, 1987, gage height, 4.52 ft, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40 ft^3/s, Mar. 5, gage height, 2.25 ft, backwater from ice; no flow, Feb. 1-24 and June 6 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	12	12	.60	.04	.00	.00	.00
2					.00	10	10	.78	.06	.00	.00	.00
3					.00	12	9.5	.75	.06	.00	.00	.00
4					.00	15	9.0	.73	.04	.00	.00	.00
5					.00	25	8.0	.68	.01	.00	.00	.00
6					.00	10	7.0	.40	.00	.00	.00	.00
7					.00	8.0	6.1	.88	.00	.00	.00	.00
8					.00	7.0	5.6	2.0	.00	.00	.00	.00
9					.00	9.0	4.8	1.7	.00	.00	.00	.00
10					.00	10	3.9	1.4	.00	.00	.00	.00
11					.00	7.0	3.5	1.1	.00	.00	.00	.00
12					.00	6.0	3.5	1.1	.00	.00	.00	.00
13					.00	5.0	3.3	.61	.00	.00	.00	.00
14					.00	4.5	2.6	.55	.00	.00	.00	.00
15					.00	4.0	2.4	.54	.00	.00	.00	.00
16					.00	3.8	2.1	.31	.00	.00	.00	.00
17					.00	3.5	1.7	.16	.00	.00	.00	.00
18					.00	3.8	1.5	.15	.00	.00	.00	.00
19					.00	4.0	1.6	.47	.00	.00	.00	.00
20					.00	4.5	1.4	.52	.00	.00	.00	.00
21					.00	5.0	1.3	.43	.00	.00	.00	.00
22					.00	7.0	1.1	.30	.00	.00	.00	.00
23					.00	8.5	1.1	.26	.00	.00	.00	.00
24					.00	10	.99	.20	.00	.00	.00	.00
25					.10	12	.76	.09	.00	.00	.00	.00
26					1.0	15	.71	.08	.00	.00	.00	.00
27					5.0	20	.69	.08	.00	.00	.00	.00
28					20	22	.67	.08	.00	.00	.00	.00
29					14	24	.48	.07	.00	.00	.00	.00
30					---	19	.60	.03	.00	.00	.00	.00
31					---	15	---	.02	---	.00	.00	---
TOTAL					40.10	321.6	107.90	17.07	0.21	0.00	0.00	0.00
MEAN					1.38	10.4	3.60	.55	.007	.00	.00	.00
MAX					20	25	12	2.0	.06	.00	.00	.00
MIN					.00	3.5	.48	.02	.00	.00	.00	.00
AC-FT					80	638	214	34	.4	.0	.0	.0

06468300 KELLY CREEK BELOW NICCUM RESERVOIR NEAR BORDULAC, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
MAR											
29...	0900	21	530	--	-4.0	0.5	--	--	--	--	--
APR											
06...	1330	6.3	480	8.65	20.0	5.0	1.5	14.7	114	4.0	170
13...	1225	3.7	570	--	7.0	9.0	--	--	--	--	--
MAY											
17...	1200	0.10	670	8.77	22.0	14.0	4.0	10.0	96	4.6	280

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)
APR											
06...	37	20	32	27	1	7.0	134	100	11	308	288
MAY											
17...	58	32	49	27	1	6.5	273	100	12	444	422

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, 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										
06...	0.42	5.27	1	0.010	0.010	<0.100	<0.100	0.040	0.040	1.0
MAY										
17...	0.60	0.12	81	<0.010	<0.010	<0.100	<0.100	0.020	0.080	0.80

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
APR										
06...	0.70	0.140	0.070	0.065	0.039	1	2	50	<1	<1
MAY										
17...	0.50	0.080	0.040	0.037	0.042	3	2	90	<1	<1

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)
APR										
06...	<1	190	63	<5	140	120	0.3	<1	<1	<3
MAY										
17...	3	200	12	<5	150	13	0.1	<1	<1	5

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)
APR										
06...	12	<0.010	<0.01	11.0	1.30	16	1100	4	0.07	100
MAY										
17...	15	<0.010	<0.01	12.0	0.600	23	1200	12	0.00	84

471924098495100 ARROWWOOD LAKE INFLOW SITE

LOCATION.--Lat 47°19'14", long 98°49'51", in NE¼NE¼ sec. 6, T.144 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, near center of Arrowwood Lake inflow channel about 1,000 feet downstream from highway bridge on county line, and 5 miles northwest of Kensal.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1987 to September 1988 (discontinued).

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 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	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)
DEC									
03...	1030	1435	-2.0	773	920	8.30	2.0	18.7	133
17...	1230	1435	-4.0	774	1200	8.00	1.5	25.0	177
28...	1130	1435	-7.5	782	1290	7.90	1.0	19.2	133
JAN									
19...	1530	1435	-13.0	--	2000	7.30	0.5	4.0	--
FEB									
03...	1100	1435	-24.0	--	2420	7.60	0.5	0.1	--
17...	1030	1435	-0.5	--	2740	6.80	1.0	0.0	--
29...	1030	1435	3.0	--	870	7.80	1.0	11.1	--
MAY									
10...	1600	1435	--	--	786	8.50	17.0	12.0	--
JUN									
02...	1700	1435	32.0	--	850	8.50	29.5	--	--
15...	1300	1435	21.5	--	850	8.65	19.5	7.7	--
JUL									
05...	1645	1435	--	--	750	8.80	29.0	10.7	--
28...	1130	1435	33.0	769	783	9.30	26.0	7.4	91
AUG									
09...	0840	1435	16.5	--	780	9.30	18.5	9.0	--
09...	1000	1435	23.0	--	1030	9.40	19.0	10.7	--
09...	1230	1435	27.0	--	775	9.50	21.5	10.6	--
09...	1400	1435	29.0	--	776	9.60	23.0	12.0	--
09...	1520	1435	30.0	--	777	9.60	24.5	12.8	--
09...	1600	1435	30.5	--	769	9.30	24.5	12.0	--
09...	1730	1435	31.0	--	766	9.60	25.5	14.0	--
09...	1800	1435	30.5	--	767	9.60	25.5	14.2	--
09...	2025	1435	26.0	--	754	9.70	25.0	12.9	--
09...	2100	1435	24.0	--	763	9.70	24.5	12.4	--
09...	2200	1435	22.0	--	757	9.70	24.0	12.1	--
10...	0001	1435	--	--	--	--	--	--	--
10...	0145	1435	16.5	--	772	9.70	22.5	10.0	--
10...	0306	1435	20.0	--	771	9.60	22.5	9.4	--
10...	0404	1435	21.5	--	762	9.60	22.0	8.7	--
10...	0504	1435	18.5	--	776	9.60	22.0	8.2	--
10...	0603	1435	18.0	--	758	9.50	21.5	7.7	--
10...	0715	1435	18.0	--	756	9.50	21.5	7.3	--
10...	0806	1435	22.5	--	765	9.50	22.5	6.7	--
10...	0930	1435	26.0	--	760	9.30	21.5	7.9	--
10...	1000	1435	26.5	--	757	9.60	22.0	7.9	--
25...	1050	1435	--	775	860	9.50	17.5	9.4	96
SEP									
08...	1000	1435	14.0	770	840	8.90	13.0	6.7	63
20...	1000	1435	6.5	--	840	8.70	8.0	10.1	--

471924098495100 ARROWWOOD LAKE INFLOW SITE--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
DEC								
03...	<0.010	<0.100	0.250	2.1	0.110	0.010	--	--
17...	<0.010	<0.100	0.410	2.6	0.340	0.010	--	--
28...	<0.010	<0.100	0.580	2.5	0.250	0.020	--	--
JAN								
19...	0.020	0.100	1.10	4.3	0.310	<0.010	--	--
FEB								
03...	<0.010	<0.100	1.80	4.1	0.140	0.030	--	--
17...	<0.010	<0.100	2.60	6.0	0.290	0.300	--	--
29...	<0.010	0.800	1.30	2.9	0.340	0.260	--	--
MAY								
10...	<0.010	<0.100	0.040	1.9	0.080	<0.010	43.0	3.30
JUN								
02...	<0.010	<0.100	0.050	1.1	0.210	0.130	62.0	6.60
15...	<0.010	<0.100	0.020	1.7	0.200	0.110	32.0	3.70
JUL								
05...	<0.010	<0.100	0.020	2.2	0.160	0.060	48.0	3.80
28...	<0.010	<0.100	0.070	3.1	0.320	0.130	40.0	4.00
AUG								
09...	0.010	<0.100	<0.010	4.1	0.290	0.180	42.0	2.30
09...	0.010	<0.100	<0.010	3.7	0.250	0.150	99.0	3.90
09...	0.010	<0.100	0.010	4.5	0.300	0.180	52.0	3.10
09...	0.010	<0.100	0.030	4.3	0.360	0.170	78.0	4.30
09...	0.010	<0.100	0.010	3.9	0.320	0.160	52.0	3.10
09...	0.010	<0.100	<0.010	3.9	0.280	0.160	37.0	2.00
09...	0.010	<0.100	0.010	3.7	0.250	0.150	37.0	2.30
09...	0.010	<0.100	<0.010	3.4	0.300	0.150	31.0	1.90
09...	0.010	<0.100	0.010	3.7	0.280	0.150	51.0	2.80
09...	0.010	<0.100	<0.010	3.4	0.240	0.140	36.0	2.00
09...	0.010	<0.100	<0.010	3.1	0.240	0.150	39.0	2.10
10...	0.010	<0.100	0.040	3.6	0.240	0.150	20.0	1.00
10...	0.010	<0.100	0.050	3.4	0.280	0.150	12.0	0.70
10...	0.020	<0.100	<0.010	3.7	0.310	0.150	59.0	2.70
10...	0.010	<0.100	<0.010	3.7	0.230	0.150	54.0	2.50
10...	0.010	<0.100	<0.010	3.5	0.300	0.150	46.0	1.80
10...	0.010	<0.100	<0.010	4.1	0.310	0.150	61.0	2.80
10...	0.010	<0.100	<0.010	3.7	0.270	0.150	87.0	3.60
10...	0.010	<0.100	<0.010	3.7	0.250	0.150	24.0	1.60
10...	<0.010	<0.100	<0.010	3.7	0.270	0.150	55.0	3.20
10...	0.010	<0.100	0.010	4.6	0.380	0.180	53.0	2.50
25...	<0.010	<0.100	0.070	6.0	0.450	0.110	130	4.20
SEP								
08...	0.010	<0.100	<0.010	3.9	0.470	0.140	110	4.10
20...	0.010	<0.100	0.050	6.0	0.850	0.200	550	17.0

471646098500500 ARROWWOOD LAKE OPEN-WATER SITE

LOCATION.--Lat 47°16'46", long 98°50'05", in SW¼NE¼ sec.19, T.144 N., Stutsman County, Hydrologic Unit 10160001, in open-water area near center of lake about 1½ miles northeast of Arrowwood National Wildlife Refuge headquarters, and about 5 miles 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 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
DEC									
03...	1130	1435	-2.0	773	1040	8.10	2.0	19.5	139
17...	1000	1435	-6.0	774	970	8.40	1.5	25.5	180
28...	1030	1435	-8.0	782	1090	8.20	1.0	15.9	109
JAN									
20...	1530	1435	-12.0	--	1520	7.80	0.5	7.7	--
FEB									
03...	1200	1435	-24.0	--	1750	7.50	0.5	0.1	--
17...	1100	1435	-0.5	--	2140	7.60	0.5	0.0	--
29...	1200	1435	3.0	--	1050	7.80	0.5	--	--
MAY									
10...	1000	1435	--	--	740	8.70	12.5	10.8	--
JUN									
02...	1100	1435	--	--	750	8.50	24.5	6.3	--
15...	1100	1435	19.5	--	700	8.77	18.0	6.3	--
JUL									
05...	1230	1435	--	--	850	8.80	22.0	5.0	--
28...	1010	1435	28.0	769	770	9.30	22.0	2.1	24
AUG									
09...	0810	1435	18.0	--	686	9.20	17.0	2.0	--
09...	1020	1435	22.5	--	695	9.20	17.5	4.7	--
09...	1155	1435	25.5	--	690	9.30	19.0	4.1	--
09...	1410	1435	27.0	--	681	9.33	18.5	7.5	--
09...	1500	1435	28.5	--	700	9.30	19.0	6.8	--
09...	1615	1435	30.0	--	690	9.45	22.5	5.2	--
09...	1705	1435	31.0	--	680	9.35	23.0	6.9	--
09...	1820	1435	31.0	--	670	9.42	24.0	7.5	--
09...	1915	1435	30.5	--	671	9.41	--	8.5	--
09...	2010	1435	29.0	--	674	9.31	22.5	6.6	--
09...	2200	1435	22.0	--	708	9.34	22.0	7.3	--
10...	0020	1435	19.0	--	715	9.34	21.5	6.0	--
10...	0200	1435	18.0	--	691	9.38	21.0	5.1	--
10...	0400	1435	22.0	--	685	9.40	20.5	4.9	--
10...	0500	1435	21.0	--	687	9.38	20.5	3.7	--
10...	0600	1435	20.0	--	705	9.32	20.5	2.1	--
10...	0700	1435	22.0	--	709	9.26	20.5	2.2	--
10...	0800	1435	23.5	--	681	9.34	20.5	2.0	--
10...	0900	1435	25.5	--	695	9.25	20.5	1.8	--
10...	1000	1435	27.0	--	671	9.37	20.5	3.2	--
25...	1130	1435	--	775	770	9.10	17.0	8.6	88
SEP									
08...	1150	1435	15.5	770	870	9.10	14.5	10.3	100
20...	1200	1435	5.0	--	881	8.70	8.0	10.0	--

471646098500500 ARROWWOOD LAKE OPEN-WATER SITE--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
DEC								
03...	<0.010	<0.100	0.170	2.1	0.260	0.010	--	--
17...	<0.010	<0.100	0.350	2.2	0.150	0.020	--	--
28...	<0.010	<0.100	0.260	2.1	0.110	0.020	--	--
JAN								
20...	0.020	<0.100	0.780	4.6	0.390	<0.010	--	--
FEB								
03...	<0.010	<0.100	1.40	4.4	0.340	0.010	--	--
17...	<0.010	<0.100	2.50	7.0	0.820	0.360	--	--
29...	<0.010	0.300	1.00	3.5	0.280	0.140	--	--
MAY								
10...	<0.010	<0.100	0.030	1.4	0.090	0.020	13.0	0.700
JUN								
02...	<0.010	<0.100	0.050	1.1	0.070	0.020	16.0	2.20
15...	<0.010	<0.100	0.010	1.1	0.080	0.030	12.0	1.60
JUL								
05...	<0.010	<0.100	0.030	3.4	0.310	0.130	23.0	1.00
28...	0.010	<0.100	0.090	2.1	0.370	0.280	1.90	<0.200
AUG								
09...	0.010	<0.100	0.090	2.1	0.330	0.250	6.00	0.400
09...	0.010	<0.100	0.060	8.0	0.330	0.240	9.20	0.800
09...	0.010	<0.100	0.040	2.3	0.330	0.230	6.20	0.400
09...	0.010	<0.100	0.020	2.4	0.280	0.200	12.0	0.600
09...	0.010	<0.100	0.030	2.4	0.340	0.200	13.0	0.800
09...	0.010	<0.100	0.030	2.6	0.290	0.180	21.0	1.60
09...	0.010	<0.100	0.060	2.5	0.320	0.180	9.40	0.500
09...	0.010	<0.100	0.030	2.1	0.260	0.170	11.0	0.800
09...	0.010	<0.100	0.060	2.6	0.340	0.210	9.50	<0.400
09...	0.010	<0.100	0.030	1.9	0.260	0.170	6.20	<0.400
09...	0.010	<0.100	0.040	2.2	0.280	0.200	1.30	<0.400
10...	0.020	<0.100	<0.010	2.0	0.300	0.200	3.00	<0.400
10...	0.010	<0.100	0.060	2.3	0.300	0.210	1.60	<0.400
10...	0.010	0.200	0.050	1.9	0.290	0.190	4.30	<0.400
10...	0.020	<0.100	0.030	2.5	0.280	0.210	3.90	<0.400
10...	0.010	<0.100	0.090	2.3	0.330	0.220	4.60	<0.400
10...	0.010	<0.100	0.070	2.0	0.330	0.230	3.30	<0.400
10...	0.020	<0.100	0.080	2.2	0.320	0.230	3.60	<0.400
10...	0.010	<0.100	0.060	2.3	0.330	0.240	2.90	<0.400
10...	0.010	<0.100	0.040	1.9	0.310	0.230	4.90	<0.400
25...	<0.010	<0.100	0.070	5.0	0.470	0.150	110	6.30
SEP								
08...	0.010	<0.100	<0.010	5.6	0.740	0.190	110	4.10
20...	0.010	<0.100	0.040	2.7	0.590	0.100	180	7.20

471555098505200 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 lake, about ¼ mile east of Arrowwood National Wildlife Refuge headquarters, and about 6 miles southwest of Kensal.

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 1987 TO SEPTEMBER 1988

DATE	TIME	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	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)
JAN									
20...	1100	1435	-12.0	--	1390	7.80	1.0	6.4	--
FEB									
03...	1300	1435	-24.0	--	1490	7.70	0.5	0.0	--
17...	1145	1435	-0.5	--	1710	7.60	0.5	0.0	--
29...	1400	1435	3.0	--	1480	7.50	1.0	3.5	--
MAY									
10...	1200	1435	--	--	730	8.60	13.0	10.5	--
JUN									
02...	1400	1435	25.0	--	770	8.50	24.5	--	--
15...	1200	1435	20.0	--	800	8.68	19.0	6.9	--
JUL									
05...	1430	1435	--	--	770	8.60	26.0	9.5	--
28...	1030	1435	29.5	769	770	8.90	22.5	5.6	64
AUG									
09...	0820	1435	--	--	750	8.90	18.0	5.6	--
09...	1030	1435	22.5	--	750	8.90	18.5	7.6	--
09...	1205	1435	26.0	--	750	9.10	19.5	6.7	--
09...	1420	1435	27.5	--	755	9.14	20.5	8.4	--
09...	1505	1435	28.5	--	756	9.22	20.5	8.7	--
09...	1630	1435	29.5	--	740	9.10	21.0	7.3	--
09...	1715	1435	30.0	--	765	9.18	21.0	9.4	--
09...	1830	1435	30.5	--	767	9.24	21.0	9.0	--
09...	1935	1435	29.5	--	755	9.41	21.0	9.5	--
09...	2005	1435	29.0	--	751	9.31	21.0	9.2	--
09...	2205	1435	23.5	--	758	9.24	20.5	9.0	--
10...	0001	1435	19.5	--	757	9.18	20.0	8.4	--
10...	0200	1435	--	--	760	9.22	20.0	8.7	--
10...	0405	1435	22.5	--	776	9.24	22.5	7.6	--
10...	0505	1435	21.0	--	764	9.18	19.5	7.2	--
10...	0600	1435	21.5	--	763	9.13	19.5	6.8	--
10...	0710	1435	22.5	--	756	8.90	19.5	6.4	--
10...	0800	1435	23.0	--	756	8.95	19.5	5.9	--
10...	0900	1435	25.5	--	758	9.01	19.5	6.4	--
10...	1000	1435	27.0	--	759	9.05	19.5	6.8	--
25...	1150	1435	--	775	760	9.50	17.5	9.3	95
SEP									
08...	1215	1435	16.0	770	780	9.70	14.0	--	--
20...	1100	1435	--	--	--	--	--	--	--

471555098505200 ARROWWOOD LAKE OUTFLOW SITE--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
JAN								
20...	0.020	<0.100	0.980	4.9	0.280	<0.010	--	--
FEB								
03...	0.020	<0.100	1.00	3.5	0.120	<0.010	--	--
17...	<0.010	<0.100	1.40	4.8	0.270	0.140	--	--
29...	<0.010	<0.100	1.80	4.0	0.280	0.150	--	--
MAY								
10...	<0.010	<0.100	0.040	1.8	0.080	0.020	42.0	1.50
JUN								
02...	0.020	<0.100	0.280	1.3	0.100	0.060	3.40	0.50
15...	0.010	<0.100	0.150	1.4	0.060	0.030	9.90	3.40
JUL								
05...	<0.010	<0.100	<0.010	2.0	0.100	0.010	67.0	6.20
28...	<0.010	<0.100	0.020	2.5	0.430	0.210	46.0	4.80
AUG								
09...	0.010	<0.100	0.060	3.0	0.400	0.260	52.0	2.30
09...	0.010	<0.100	0.020	3.0	0.420	0.250	95.0	5.50
09...	0.010	<0.100	0.030	3.0	0.350	0.240	52.0	2.70
09...	0.010	<0.100	0.030	2.8	0.390	0.250	58.0	2.60
09...	0.010	<0.100	0.020	3.0	0.350	0.250	45.0	2.30
09...	0.010	<0.100	0.010	3.5	0.390	0.240	82.0	3.00
09...	0.010	<0.100	0.020	3.0	0.390	0.240	47.0	2.30
09...	0.010	<0.100	<0.010	3.5	0.340	0.240	55.0	3.10
09...	0.010	<0.100	0.060	2.8	0.340	0.250	64.0	1.90
09...	0.010	<0.100	0.030	2.7	0.330	0.240	58.0	3.10
09...	0.010	<0.100	0.210	2.8	0.330	0.260	23.0	1.30
10...	0.020	<0.100	0.040	2.8	0.320	0.230	62.0	2.30
10...	0.010	<0.100	0.040	2.9	0.270	0.240	78.0	4.30
10...	0.010	<0.100	0.050	2.7	0.340	0.260	49.0	2.30
10...	0.010	<0.100	0.050	3.0	0.300	0.220	54.0	2.60
10...	0.010	<0.100	0.050	2.7	0.330	0.240	51.0	2.60
10...	0.010	<0.100	0.030	2.6	0.340	0.230	71.0	3.50
10...	0.010	<0.100	0.050	3.2	0.330	0.240	75.0	3.50
10...	0.010	<0.100	0.040	3.3	0.420	0.240	88.0	5.50
10...	0.010	<0.100	<0.010	3.2	0.330	0.230	130	7.00
25...	0.010	<0.100	0.050	3.9	0.490	0.240	93.0	3.40
SEP								
08...	<0.010	<0.100	<0.010	3.7	0.530	0.280	62.0	0.80
20...	0.010	<0.100	0.040	2.7	0.680	0.350	160	2.20

06468500 JAMES RIVER NEAR PINGREE, ND

LOCATION.--Lat 47°08'30", long 98°47'00", in SW¼SW¼ sec.3, T.142 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on right bank 500 ft upstream from dam at outlet of DePuy Marsh, 6.5 mi southeast of Pingree, and 6.25 mi northeast of Buchanan.

DRAINAGE AREA.--1,670 mi^2, approximately, of which about 900 mi^2 is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1979 to current year.

REMARKS.--Current sampling site is located at bridge 2 mi upstream from former stream-gaging station.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	TURBIDITY (FTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L) (00310)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
OCT 05...	1200	670	8.55	8.0	10.0	17	100	11.4	100	--	250	47
NOV 18...	0900	750	8.81	-10.0	1.0	10	4.3	14.4	100	--	290	57
APR 13...	0900	700	8.30	5.0	8.0	19	13	12.5	104	7.0	270	51
MAY 17...	1330	740	8.60	23.0	15.0	17	22	11.0	108	5.9	260	49

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)	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)
OCT 05...	31	49	29	1	14	266	91	11	0.20	428	403	0.58
NOV 18...	36	56	28	1	14	290	110	15	0.20	497	462	0.68
APR 13...	35	56	30	2	10	263	120	14	0.20	454	444	0.62
MAY 17...	34	58	32	2	8.6	271	130	15	0.30	500	458	0.68

DATE	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)	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)
OCT 05...	332	--	<0.010	--	<0.100	--	0.030	--	0.70	--
NOV 18...	5	--	<0.010	--	<0.100	--	0.020	--	1.1	--
APR 13...	31	<0.010	<0.010	<0.100	<0.100	0.020	0.020	2.3	1.0	0.150
MAY 17...	37	<0.010	<0.010	<0.100	<0.100	0.030	0.040	1.1	0.70	0.080

DATE	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOROUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)
OCT 05...	0.060	--	0.027	--	4	--	140	--	<1	--	1
NOV 18...	0.020	--	0.001	--	2	--	140	--	<1	--	<1
APR 13...	0.020	0.024	0.002	2	1	100	100	2	<1	1	1
MAY 17...	0.030	0.029	0.018	2	3	--	120	1	<1	--	<1

06468500 JAMES RIVER NEAR PINGREE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
OCT 05...	--	13	<5	--	--	18	0.3	--	--	1	--
NOV 18...	--	5	<5	--	--	11	0.1	--	--	1	--
APR 13...	470	6	<5	40	300	7	0.1	1	<1	<1	240
MAY 17...	900	6	<5	--	250	16	0.2	--	<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)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 05...	<3	--	--	<0.01	--	--	--	--	461	94
NOV 18...	<3	--	--	--	--	--	--	--	17	92
APR 13...	<3	16	<0.010	<0.01	30.0	1.60	18	1200	26	96
MAY 17...	3	16	<0.010	<0.01	30.0	1.10	27	1200	46	98

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 mi^2, approximately, of which about 1,010 mi^2 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. June 22, 1959, to June 3, 1971 at site 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, 36,020 acre-ft, Oct. 1, elevation, 1,432.86 ft; minimum, 25,430 acre-ft, Sept. 30, elevation, 1,428.04 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,432.86	36,020	--
Oct. 31	1,430.76	30,980	-5,040
Nov. 30	1,429.95	29,220	-1,760
Dec. 31	[a]1,430.04	29,410	+190
CAL YR 1987	-	-	+110
Jan. 31	[a]1,430.10	29,540	+130
Feb. 29	1,430.23	29,820	+280
Mar. 31	1,430.83	31,140	+1,320
Apr. 30	1,431.46	32,590	+1,450
May 31	1,431.89	33,600	+1,010
June 30	1,431.03	31,580	-2,020
July 31	1,429.60	28,500	-3,080
Aug. 31	1,428.43	26,180	-2,320
Sept. 30	1,428.12	25,590	-590
WTR YR 1988	-	-	-10,430

a - End-of-month elevation not recorded. Value shown was observed at 8:00 a.m. on last day of the month.

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 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
OCT												
20...	1310	3.30	30.0	3.5	100	330	15	780	--	510	8.30	7.5
FEB												
01...	1415	0.0	22.0	-22.0	10	315	<5.0	783	2.00	655	7.90	1.5
APR												
25...	1135	0.0	E27.0	7.0	5	0	15	768	--	600	8.70	8.5
JUL												
27...	1030	1.60	53.0	29.0	0	--	5.0	770	--	654	8.30	22.5

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	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)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
OCT											
20...	9	30.0	10.2	83	190	38	22	39	29	1	14
FEB											
01...	8	55.2	12.3	85	230	47	27	47	29	1	18
APR											
25...	13	E48.0	11.6	99	210	42	26	44	30	1	7.0
JUL											
27...	14	27.0	8.3	95	220	44	27	49	32	1	8.0

DATE	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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT											
20...	204	75	7.1	0.20	19	343	339	0.47	0.440	0.110	100
FEB											
01...	255	88	11	0.20	34	410	426	0.56	0.240	0.150	100
APR											
25...	233	80	10	0.20	16	378	365	0.51	<0.100	0.090	100
JUL											
27...	239	87	11	0.20	18	409	389	0.56	0.280	0.110	110

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
OCT							
20...	1300	0.0	510	8.30	7.5	10.2	83
20...	1304	1.60	510	8.30	7.5	10.2	83
20...	1310	3.30	510	8.30	7.5	10.2	83
20...	1314	6.60	510	8.30	7.5	10.2	83
20...	1318	13.2	510	8.30	7.5	10.2	83
20...	1322	19.8	510	8.30	7.5	10.2	83
20...	1326	26.4	510	8.30	7.5	10.2	83
20...	1330	29.7	510	8.30	7.5	10.2	83
FEB							
01...	1415	0.0	655	7.90	1.5	12.3	85
01...	1417	1.60	640	8.00	1.0	12.1	83
01...	1419	3.30	632	8.10	2.0	11.6	82
01...	1421	6.60	633	8.20	2.5	11.0	79
01...	1423	13.2	637	8.10	3.0	9.5	69
01...	1425	19.8	641	8.10	3.0	7.6	55
APR							
25...	1135	0.0	600	8.70	8.5	11.6	99
25...	1137	1.60	600	8.70	8.5	11.6	98
25...	1139	3.30	600	8.60	8.5	11.6	98
25...	1141	6.60	600	8.60	8.5	11.5	97
25...	1143	13.2	600	8.60	8.5	11.5	97
25...	1145	19.8	600	8.60	8.5	11.5	97
25...	1147	26.4	600	8.60	8.5	11.5	97
JUL							
27...	1030	1.60	654	8.30	22.5	8.3	95
27...	1032	3.30	655	8.20	23.0	8.2	94
27...	1033	6.60	655	8.20	22.5	8.0	91
27...	1034	13.2	657	8.20	22.5	7.8	89
27...	1035	19.8	656	8.20	22.5	7.7	88
27...	1036	26.4	655	8.20	22.5	7.7	88
27...	1037	33.0	655	8.20	22.5	7.5	85
27...	1038	39.6	654	8.20	22.5	7.1	81
27...	1039	46.2	654	8.20	22.0	7.3	83
27...	1040	52.8	653	8.20	22.0	6.9	78

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 mi^2, of which about 440 mi^2 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. 17 to Apr. 7, May 10-16, and May 19 to July 8. Records poor.

AVERAGE DISCHARGE.--15 years, 26.2 ft^3/s, 18,900 acre-ft/yr; median of yearly mean discharges, 19 ft^3/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,520 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Apr. 1	0815	*250	*a7.58				

No flow for several days.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	1.9	.44	.24	.13	65	190	19	1.1	.04	.00	.00
2	6.4	1.9	.43	.23	.12	50	170	19	.90	.03	.00	.00
3	5.2	1.7	.43	.22	.12	40	150	19	.80	.03	.00	.00
4	4.5	1.6	.42	.22	.12	35	140	18	1.0	.02	.01	.00
5	5.2	1.5	.42	.21	.12	50	120	15	1.0	.02	.01	.00
6	5.0	1.3	.41	.20	.12	40	98	12	.85	.02	.00	.00
7	4.5	1.2	.40	.20	.12	35	96	12	.70	.02	.00	.00
8	4.1	1.1	.38	.20	.11	30	85	14	.60	.01	.00	.00
9	4.1	1.0	.36	.19	.11	25	76	13	.50	.01	.00	.00
10	4.1	.96	.34	.19	.11	20	70	9.1	.45	.01	.00	.00
11	4.0	.92	.33	.18	.11	16	64	8.5	.35	.01	.00	.00
12	3.8	.90	.32	.18	.11	14	61	6.9	.33	.01	.00	.00
13	4.2	.86	.32	.17	.11	12	55	6.1	.30	.01	.00	.00
14	4.7	.80	.31	.17	.11	10	49	6.4	.35	.01	.00	.00
15	4.1	.70	.31	.17	.11	9.0	48	7.9	.35	.00	.00	.00
16	4.1	.64	.30	.17	.10	8.0	45	6.1	.25	.00	.00	.00
17	6.0	.58	.30	.16	.10	6.0	43	5.2	.20	.00	.00	.00
18	5.0	.50	.30	.16	.10	7.0	38	5.7	.15	.00	.00	.00
19	4.5	.49	.30	.16	.10	8.0	38	5.0	.12	.00	.00	.00
20	4.0	.49	.30	.16	.10	10	36	4.3	.10	.00	.00	.00
21	3.5	.48	.29	.15	.10	12	35	3.5	.10	.00	.00	.00
22	3.3	.47	.29	.15	.10	14	34	3.0	.15	.00	.00	.00
23	2.9	.47	.28	.14	.10	20	32	2.5	.20	.00	.00	.00
24	2.7	.46	.28	.14	.10	25	30	2.0	.20	.00	.00	.00
25	2.5	.46	.28	.14	.10	30	30	2.5	.15	.00	.00	.00
26	2.4	.46	.28	.14	1.0	40	26	2.5	.13	.00	.00	.00
27	2.2	.46	.28	.14	10	60	26	2.3	.10	.00	.00	.00
28	2.1	.46	.27	.14	80	80	24	2.0	.08	.00	.00	.00
29	2.0	.45	.27	.13	100	145	22	1.8	.06	.00	.00	.00
30	1.9	.45	.26	.13	---	180	24	1.5	.05	.00	.00	.00
31	1.9	---	.25	.13	---	220	---	1.3	---	.00	.00	---
TOTAL	122.7	25.66	10.15	5.31	193.73	1316.0	1955	237.1	11.62	0.25	0.02	0.00
MEAN	3.96	.86	.33	.17	6.68	42.5	65.2	7.65	.39	.008	.001	.00
MAX	7.8	1.9	.44	.24	100	220	190	19	1.1	.04	.01	.00
MIN	1.9	.45	.25	.13	.10	6.0	22	1.3	.05	.00	.00	.00
AC-FT	243	51	20	11	384	2610	3880	470	23	.5	.04	.0

CAL YR 1987 TOTAL 14717.45 MEAN 40.3 MAX 650 MIN .25 AC-FT 29190
WTR YR 1988 TOTAL 3877.54 MEAN 10.6 MAX 220 MIN .00 AC-FT 7690

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
OCT 05...	1145	4.5	980	--	8.0	9.0	--	--	--	--	--
MAR 29...	1220	146	590	--	-4.0	0.5	--	--	--	--	--
APR 07...	1000	96	690	8.45	7.0	9.0	250	49	30	57	32
MAY 12...	1500	4.3	1060	--	25.0	15.0	--	--	--	--	--

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 07...	2	17	210	160	14	0.10	14	458	466	119	0.62

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 07...	2	180	50	1	35	10	0.9	1	2	220

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 mi^2, approximately, of which about 1,650 mi^2 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: Dec. 30 to Feb. 27. Records good except those for period of estimated daily discharges, which are fair. 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.--52 years (water years 1929-33, 1938-39, 1944-88), 66.1 ft^3/s, 47,890 acre-ft/yr; median of yearly mean discharges, 40 ft^3/s, 29,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,390 ft^3/s, May 13, 1950, gage height, 15.82 ft, site and datum then in use; no flow at times in 1933.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 251 ft^3/s, Oct. 4, gage height, 5.01 ft; minimum daily, 0.02 ft3/s, Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	250	241	13	6.5	3.4	106	101	12	1.5	34	25	9.9
2	249	241	13	6.0	3.3	141	110	11	3.3	34	27	9.2
3	250	241	13	5.7	3.3	163	111	8.9	7.1	27	24	5.8
4	251	240	12	5.5	3.3	172	113	8.1	23	22	22	2.8
5	251	237	12	5.3	3.3	176	113	6.8	31	20	20	2.0
6	251	236	12	5.2	3.3	169	131	6.0	33	20	19	1.6
7	250	235	12	5.1	3.2	154	211	6.5	34	19	19	1.4
8	250	233	13	5.0	3.2	188	213	6.8	34	19	19	1.0
9	248	233	13	4.7	3.1	179	213	5.9	33	19	18	.70
10	246	223	12	4.5	3.1	133	212	5.7	20	19	18	.60
11	245	194	12	4.5	3.0	109	213	5.4	12	19	18	.42
12	245	174	11	4.4	3.0	196	213	4.7	28	24	18	.36
13	246	156	10	4.4	3.0	142	207	4.2	19	29	21	.14
14	246	78	10	4.3	3.2	94	195	3.9	20	27	19	.03
15	245	45	10	4.3	3.4	46	180	3.6	9.4	26	18	.27
16	246	43	10	4.2	3.7	37	154	3.2	5.1	26	17	.25
17	244	25	9.6	4.2	4.4	34	71	3.8	4.1	26	17	.02
18	243	6.4	9.6	4.1	4.6	34	66	3.9	4.3	25	17	4.0
19	244	17	9.5	4.1	5.0	33	65	5.1	6.9	24	15	16
20	234	20	9.1	4.0	5.5	32	63	4.8	8.6	23	16	4.8
21	207	19	8.9	4.0	6.2	32	62	4.8	9.3	21	14	1.9
22	241	18	8.7	3.9	6.8	34	36	4.8	15	21	14	1.3
23	242	17	8.4	3.8	6.3	35	17	4.7	24	20	13	.97
24	242	16	8.4	3.7	6.0	34	11	17	15	20	12	.56
25	242	15	8.5	3.5	15	34	9.1	8.0	11	21	11	.42
26	241	15	8.5	3.5	30	31	8.1	3.5	12	21	10	.56
27	238	15	8.4	3.4	100	31	7.8	2.9	12	20	11	.70
28	243	14	8.1	3.4	170	32	8.0	2.2	29	21	10	.81
29	243	13	7.8	3.4	132	31	8.4	1.6	37	23	11	.85
30	242	13	7.4	3.4	---	31	15	1.6	36	23	10	.84
31	241	---	7.0	3.4	---	36	---	1.3	---	22	9.9	---
TOTAL	7556	3273.4	315.9	135.4	543.6	2699	3137.4	172.7	537.6	715	512.9	70.20
MEAN	244	109	10.2	4.37	18.7	87.1	105	5.57	17.9	23.1	16.5	2.34
MAX	251	241	13	6.5	170	196	213	17	37	34	27	16
MIN	207	6.4	7.0	3.4	3.0	31	7.8	1.3	1.5	19	9.9	.02
AC-FT	14990	6490	627	269	1080	5350	6220	343	1070	1420	1020	139

CAL YR 1987 TOTAL 73032.1 MEAN 200 MAX 537 MIN 4.0 AC-FT 144900
WTR YR 1988 TOTAL 19669.10 MEAN 53.7 MAX 251 MIN .02 AC-FT 39010

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
05...	1430	251	550	8.00	9.0	12.0	11	10.4	95	--	200
NOV											
17...	1500	15	740	8.32	0.0	3.5	3.8	13.4	100	--	290
JAN											
07...	1540	5.1	1140	7.75	-14.0	1.0	4.1	9.4	65	--	450
FEB											
23...	1300	6.3	1150	7.81	-10.0	2.0	4.0	8.2	59	--	430
MAR											
29...	1510	30	--	--	3.0	4.5	--	--	--	--	--
APR											
07...	1200	216	610	8.75	18.0	6.5	4.3	13.8	112	7.8	260
MAY											
17...	1700	4.6	950	8.31	28.0	20.0	11	13.4	146	4.6	340
JUN											
28...	1400	33	620	8.20	30.0	26.5	17	9.0	111	--	220
AUG											
22...	1100	14	700	8.33	25.0	20.0	20	7.6	83	4.4	250

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											
05...	44	23	36	26	1	16	202	97	9.1	346	350
NOV											
17...	68	30	50	26	1	12	248	140	16	478	467
JAN											
07...	110	42	91	30	2	12	387	230	30	771	750
FEB											
23...	110	37	90	31	2	8.9	366	230	34	747	734
APR											
07...	56	28	40	25	1	7.4	218	120	10	418	393
MAY											
17...	78	35	82	34	2	7.5	303	190	28	637	603
JUN											
28...	47	25	51	33	2	8.0	228	86	12	400	366
AUG											
22...	53	29	56	31	2	12	257	110	13	439	428

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, 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, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT										
05...	0.47	234	25	--	0.030	--	0.380	--	0.110	--
NOV										
17...	0.65	19.5	11	--	<0.010	--	0.300	--	0.110	--
JAN										
07...	1.05	10.6	2	--	0.020	--	0.220	--	0.270	--
FEB										
23...	1.02	12.7	13	--	<0.010	--	0.310	--	0.500	--
APR										
07...	0.57	244	20	<0.010	<0.010	<0.100	<0.100	0.040	0.040	1.8
MAY										
17...	0.87	7.91	45	<0.010	<0.010	<0.100	<0.100	0.050	0.060	0.50
JUN										
28...	0.54	35.6	60	--	<0.010	--	<0.100	--	0.090	--
AUG										
22...	0.60	16.6	42	<0.010	<0.010	<0.100	<0.100	0.040	0.040	1.3

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHOROUS 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 05...	0.50	--	0.080	--	0.429	--	3	80	--	<1
NOV 17...	0.90	--	0.030	--	0.017	--	2	150	--	<1
JAN 07...	0.70	--	0.040	--	0.013	--	2	290	--	<1
FEB 23...	0.90	--	0.030	--	0.025	--	2	310	--	<1
APR 07...	0.90	0.190	0.040	0.034	0.013	2	2	70	<1	<1
MAY 17...	0.50	0.110	0.030	0.044	0.053	4	2	310	1	<1
JUN 28...	0.70	--	0.060	--	0.031	--	3	130	--	1
AUG 22...	0.50	0.150	0.050	<0.001	0.035	4	3	150	<1	<1

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 05...	1	--	10	<5	--	310	0.2	--	<1	<3
NOV 17...	<1	--	17	<5	--	820	0.2	--	<1	<3
JAN 07...	2	--	110	<5	--	1100	0.1	--	<1	6
FEB 23...	1	--	81	<5	--	1900	0.2	--	<1	6
APR 07...	<1	460	9	<5	890	590	0.2	<1	<1	5
MAY 17...	<1	1400	17	<5	1100	630	0.2	<1	<2	3
JUN 28...	<1	--	23	<5	--	240	0.8	--	<1	35
AUG 22...	2	120	8	7	500	140	82	<1	<1	14

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 05...	--	--	<0.01	--	--	--	--	31	21	91
NOV 17...	--	--	--	--	--	--	--	33	1.3	86
FEB 23...	--	--	<0.01	--	--	--	--	80	1.4	22
APR 07...	16	<0.010	<0.01	66.0	1.80	21	1200	24	14	89
MAY 17...	13	<0.010	<0.01	28.0	1.00	21	1100	57	0.71	84
JUN 28...	--	--	<0.01	--	--	--	--	59	5.3	99
AUG 22...	13	<0.010	<0.01	1.60	<0.200	9.4	1200	50	1.9	99

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 mi^2, approximately, of which about 2,600 mi^2 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.-Estimated daily discharges: Feb. 2-24 and May 21-24. 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.--38 years (water years 1951-88), 102 ft^3/s, 73,900 acre-ft/yr; median of yearly mean discharges, 72 ft^3/s, 52,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,800 ft^3/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, 356 ft^3/s, Oct. 8, gage height, 7.87 ft; minimum daily, 2.6 ft^3/s, Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	262	43	25	23	31	88	27	30	14	17	15
2	168	272	47	24	20	32	82	51	24	20	32	18
3	187	266	48	24	19	32	89	58	20	31	37	17
4	209	275	39	22	18	38	129	35	15	41	36	15
5	233	254	40	19	17	46	136	34	10	26	34	14
6	242	260	45	17	16	65	125	18	11	30	25	14
7	248	260	45	17	15	89	125	50	14	49	36	14
8	265	255	45	17	14	105	151	62	14	30	25	23
9	246	252	45	16	13	110	141	31	17	30	18	9.8
10	246	248	40	15	12	125	188	19	27	29	17	4.5
11	250	257	43	17	11	143	196	29	32	22	23	16
12	249	254	42	18	10	127	218	40	56	22	21	9.3
13	257	241	38	16	9.0	135	230	8.2	50	49	24	5.4
14	249	216	35	15	9.5	177	223	8.9	62	28	21	4.9
15	252	214	36	16	10	148	220	9.9	70	43	59	6.6
16	257	182	39	18	11	135	199	10	53	30	55	9.4
17	252	128	38	18	12	136	187	5.3	44	36	37	8.6
18	255	89	36	19	13	122	187	14	39	33	23	13
19	252	90	35	19	22	99	182	38	36	31	19	31
20	256	56	34	20	25	83	126	25	15	31	16	2.6
21	242	55	32	20	26	77	104	22	16	28	18	8.0
22	258	57	33	20	25	75	104	20	20	27	24	22
23	240	58	32	20	24	77	100	22	12	20	24	20
24	227	55	32	20	23	86	97	25	20	19	14	18
25	238	55	30	22	19	96	87	17	14	19	17	12
26	272	53	28	19	20	84	64	33	9.8	18	10	15
27	256	53	27	18	25	88	56	24	12	18	20	6.3
28	262	52	27	18	31	107	46	27	25	19	12	9.6
29	263	50	27	19	31	92	37	31	12	22	12	12
30	261	41	28	20	---	92	38	24	14	14	10	5.4
31	264	---	27	22	---	90	---	24	---	18	18	---
TOTAL	7499	4860	1136	590	523.5	2942	3955	842.3	793.8	847	754	379.4
MEAN	242	162	36.6	19.0	18.1	94.9	132	27.2	26.5	27.3	24.3	12.6
MAX	272	275	48	25	31	177	230	62	70	49	59	31
MIN	143	41	27	15	9.0	31	37	5.3	9.8	14	10	2.6
AC-FT	14870	9640	2250	1170	1040	5840	7840	1670	1570	1680	1500	753

CAL YR 1987 TOTAL 105818 MEAN 290 MAX 2470 MIN 17 AC-FT 209900
WTR YR 1988 TOTAL 25122.0 MEAN 68.6 MAX 275 MIN 2.6 AC-FT 49830

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1957 to current year.

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: June 1953 to September 1975, October 1976 to current year.
SPECIFIC CONDUCTANCE: 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.--
WATER TEMPERATURE: Maximum, 33.0°C, July 12, 13, 1957; July 23, 1977; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum daily, 1,880 microsiemens, Jan. 31, 1979; minimum daily, 200 microsiemens, Mar. 24-26, 1978.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 29.5°C, June 3; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,560 microsiemens, Jan. 16-18; minimum, 540 microsiemens, Oct. 5.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)
OCT 07...	1000	241	580	8.35	-2.0	7.5	28	--	11.0	90	--
NOV 17...	1200	138	670	8.58	-5.0	1.0	13	--	15.0	104	--
JAN 13...	1000	16	1530	8.04	-20.0	0.5	14	2.6	20.0	135	--
FEB 24...	1000	23	1120	7.50	-18.0	0.5	27	--	15.2	103	--
MAR 30...	0930	89	640	--	-5.0	0.5	--	--	--	--	--
APR 12...	1500	228	670	9.25	20.0	10.5	28	--	17.5	154	13
MAY 24...	1300	25	900	8.55	25.0	20.0	25	21	14.4	155	7.4
JUN 30...	1330	14	1080	8.78	25.0	20.0	40	22	9.6	104	--
AUG 22...	1300	26	870	8.40	26.0	22.5	25	17	6.0	69	5.0

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
OCT 07...	--	--	--	--	--	--	15	212	90	9.9	0.20
NOV 17...	--	--	--	--	--	--	12	233	110	16	0.20
JAN 13...	480	140	31	140	39	3	6.0	281	290	69	0.30
FEB 24...	--	--	--	--	--	--	9.0	360	190	39	0.20
APR 12...	--	--	--	--	--	--	11	194	150	17	0.20
MAY 24...	320	67	37	76	34	2	3.0	288	150	35	0.30
JUN 30...	380	81	42	110	38	3	10	361	180	52	0.30
AUG 22...	300	66	32	75	34	2	12	295	130	28	0.20

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)	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)
JAN 13...	758	846	1.03	33.6	16	--	--	--	<0.100	--	--
APR 12...	--	--	--	--	--	<0.010	--	<0.100	--	0.020	--
MAY 24...	588	542	0.80	39.7	42	0.010	<0.010	<0.100	<0.100	0.020	0.020
JUN 30...	730	695	0.99	27.6	78	--	<0.010	--	<0.100	--	0.040
AUG 22...	545	522	0.74	38.0	59	<0.010	<0.010	<0.100	<0.100	0.100	0.090

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHOROUS TOTAL (MG/L AS P) (00665)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHOROUS 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 07...	--	--	--	--	--	--	--	3	--	--	<1
NOV 17...	--	--	--	--	--	--	--	2	--	--	<1
JAN 13...	--	--	--	<0.010	--	--	--	1	420	--	<1
FEB 24...	--	--	--	--	--	--	--	1	--	--	--
APR 12...	1.1	--	0.270	--	0.046	--	2	2	--	1	--
MAY 24...	1.3	0.90	0.300	0.030	0.054	0.005	4	3	240	1	<1
JUN 30...	--	0.90	--	0.580	--	0.410	--	16	370	--	1
AUG 22...	2.1	0.40	0.310	0.100	<0.001	0.081	6	5	230	<1	<1

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	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 07...	<0	1	--	--	0	--	--	0.2	--	--	--
NOV 17...	<0	1	--	--	<0	--	--	0.1	--	--	--
JAN 13...	--	1	--	10	<5	--	690	<0.1	--	<1	3
FEB 24...	--	--	--	--	--	--	--	<0.1	--	--	--
APR 12...	--	--	1100	--	--	600	--	0.1	<1	--	--
MAY 24...	--	1	1100	8	<5	1800	830	0.2	<1	<1	<3
JUN 30...	--	<1	--	32	<5	--	1400	0.4	--	<1	39
AUG 22...	--	1	120	6	16	1700	840	0.7	<1	<1	6

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 07...	--	--	--	--	--	--	--	27	17	98
NOV 17...	--	--	--	--	--	--	--	10	3.9	100
JAN 13...	--	--	--	--	--	--	--	234	10	13
FEB 24...	--	--	--	--	--	--	--	77	4.7	30
APR 12...	19	<0.010	--	52.0	1.90	32	1200	84	52	98
MAY 24...	15	<0.010	<0.01	69.0	8.20	23	1200	53	3.6	95
JUN 30...	--	--	<0.01	--	--	--	--	64	2.4	99
AUG 22...	14	<0.010	0.01	32.0	5.90	18	1300	51	3.6	99

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
APR								
12...	1500	--	--	10.5	670	9.25	17.5	154
12...	1600	0.0	--	10.5	670	--	--	--
12...	1602	20.0	2.0	10.5	670	--	--	--
12...	1604	40.0	2.0	10.5	670	--	--	--
12...	1606	60.0	2.0	10.5	670	--	--	--
12...	1608	80.0	2.0	10.5	670	--	--	--
12...	1610	100	2.0	10.5	670	--	--	--
12...	1612	120	2.0	10.5	670	--	--	--
12...	1615	140	2.0	10.5	670	--	--	--

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	11.0	12.9	6.3	5.3	5.5	.7	.5	.6	.2	.2	.2
2	11.0	9.5	10.3	7.6	6.4	7.0	.5	.0	.4	.5	.0	.3
3	11.5	8.5	9.9	7.8	7.2	7.5	.2	.0	.2	.5	.0	.2
4	12.5	10.0	11.2	7.4	6.1	7.0	.2	.2	.2	.5	.0	.1
5	11.4	9.5	10.4	6.0	4.8	5.5	.2	.0	.2	.2	.0	.1
6	9.4	8.5	8.9	5.5	4.2	5.0	.5	.0	.2	.2	.0	.2
7	9.4	7.5	8.0	4.8	3.9	4.5	.5	.0	.3	.2	.0	.0
8	9.2	7.6	8.5	3.9	2.0	3.0	.7	.0	.4	.0	.0	.0
9	7.6	5.3	6.5	2.1	1.0	1.5	.7	.5	.7	.0	.0	.0
10	6.5	4.4	5.5	1.5	.6	1.0	.7	.5	.7	.0	.0	.0
11	7.1	5.0	6.0	2.0	.4	1.0	.7	.7	.7	.0	.0	.0
12	8.1	5.5	7.0	3.1	1.5	2.5	.7	.7	.7	.0	.0	.0
13	8.0	6.6	7.5	3.3	1.9	2.5	.7	.5	.6	.0	.0	.0
14	7.7	6.6	7.0	3.4	2.2	3.0	.5	.5	.5	.0	.0	.0
15	7.4	7.0	7.0	4.1	3.3	3.5	.5	.0	.1	.0	.0	.0
16	7.3	7.0	7.0	3.8	2.5	3.0	.5	.0	.3	.0	.0	.0
17	7.8	6.0	7.0	2.1	1.0	1.5	.5	.0	.3	.0	.0	.0
18	7.2	6.0	6.5	1.7	.5	1.0	.7	.0	.5	.0	.0	.0
19	6.2	5.2	5.5	.5	.0	.3	1.0	.5	.7	.0	.0	.0
20	5.1	4.0	4.5	1.5	.0	.8	1.0	.5	.9	.0	.0	.0
21	3.8	3.0	3.5	1.7	.5	1.2	1.0	.5	.7	.0	.0	.0
22	2.8	1.9	2.5	1.5	1.0	1.2	1.2	.7	.9	.0	.0	.0
23	3.3	2.2	3.0	1.5	.5	1.0	1.0	.5	.9	.0	.0	.0
24	2.7	2.0	2.5	1.2	.5	1.0	1.0	.5	.8	.0	.0	.0
25	3.8	1.5	2.5	1.0	.5	.9	.7	.5	.6	.0	.0	.0
26	5.2	3.6	4.5	.7	.0	.6	1.0	.5	.8	.0	.0	.0
27	4.6	3.2	4.0	.7	.0	.4	1.0	.5	.7	.0	.0	.0
28	4.7	3.4	4.0	.5	.0	.2	.7	.5	.7	.0	.0	.0
29	5.5	3.7	4.5	.5	.0	.3	.5	.0	.3	.0	.0	.0
30	5.8	4.4	5.0	.5	.0	.3	.2	.0	.2	.0	.0	.0
31	5.9	4.5	5.0	---	---	---	.2	.0	.2	.0	.0	.0
MONTH	14.0	1.5	6.4	7.8	.0	2.5	1.2	.0	.5	.5	.0	.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.0	.0	.0	1.6	.0	.7	17.9	16.8	17.4
2	.0	.0	.0	.0	.0	.0	2.3	.3	1.2	17.7	16.4	17.0
3	.0	.0	.0	.0	.0	.0	3.7	.9	2.3	17.3	14.7	15.9
4	.0	.0	.0	.0	.0	.0	8.7	2.9	5.7	16.1	12.8	14.5
5	.0	.0	.0	.0	.0	.0	9.6	7.8	8.7	17.6	14.1	15.6
6	.0	.0	.0	.2	.0	.0	11.2	7.4	9.2	18.3	15.9	17.2
7	.0	.0	.0	.0	.0	.0	12.2	9.1	10.5	18.3	16.7	17.4
8	.0	.0	.0	.2	.0	.0	12.1	9.7	11.5	17.8	15.7	17.0
9	.0	.0	.0	.0	.0	.0	9.4	7.1	8.1	17.3	13.2	15.3
10	.0	.0	.0	.0	.0	.0	9.3	5.8	7.5	18.6	15.4	16.8
11	.0	.0	.0	.0	.0	.0	10.9	7.4	9.1	20.6	17.0	18.7
12	.0	.0	.0	.0	.0	.0	11.5	8.3	9.9	22.0	18.7	19.8
13	.0	.0	.0	.0	.0	.0	11.6	9.6	10.5	18.9	16.3	17.4
14	.0	.0	.0	.0	.0	.0	10.6	8.0	9.3	19.6	16.0	17.8
15	.0	.0	.0	.0	.0	.0	11.2	7.3	9.2	18.3	15.8	17.2
16	.0	.0	.0	.0	.0	.0	12.4	8.5	10.3	16.8	15.3	16.1
17	.0	.0	.0	.0	.0	.0	11.6	9.0	10.1	19.1	15.2	16.9
18	.0	.0	.0	.0	.0	.0	10.5	7.0	8.7	21.5	18.0	19.6
19	.0	.0	.0	.0	.0	.0	11.6	7.6	9.5	21.2	20.3	20.6
20	.0	.0	.0	.0	.0	.0	10.8	7.7	9.5	20.6	19.4	19.9
21	.0	.0	.0	.2	.0	.0	10.7	8.5	9.5	20.0	18.0	19.0
22	.0	.0	.0	.0	.0	.0	10.1	7.8	9.0	19.3	16.8	17.8
23	.0	.0	.0	.2	.0	.1	11.0	7.0	8.9	22.8	17.9	20.1
24	.0	.0	.0	.2	.0	.0	11.6	8.8	10.2	22.2	19.1	20.6
25	.0	.0	.0	.0	.0	.0	11.4	8.3	9.9	22.7	19.4	21.1
26	.0	.0	.0	.5	.0	.1	10.5	8.3	9.2	24.3	21.7	22.7
27	.0	.0	.0	.2	.0	.1	11.6	7.3	9.3	24.7	21.8	22.9
28	.0	.0	.0	.5	.0	.1	14.5	9.4	11.3	25.4	22.9	24.0
29	.0	.0	.0	1.0	.0	.3	15.8	12.2	13.9	26.6	23.5	25.0
30	---	---	---	1.3	.0	.5	18.4	14.8	16.4	25.7	24.1	25.0
31	---	---	---	1.5	.0	.6	---	---	---	26.8	23.9	25.3
MONTH	.0	.0	.0	1.5	.0	.1	18.4	.0	9.0	26.8	12.8	19.1

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	26.5	24.5	25.6	20.1	19.1	19.6	24.0	22.0	22.9	20.0	17.2	18.5
2	25.9	24.8	25.3	22.4	18.7	20.4	23.0	21.0	21.8	19.2	17.6	18.5
3	29.5	25.8	27.3	23.6	20.9	22.1	22.9	21.7	22.3	18.2	16.3	17.4
4	28.7	26.5	27.6	25.3	22.3	23.6	21.7	20.8	21.3	17.7	15.7	16.8
5	28.4	26.2	27.2	26.8	23.6	25.2	21.8	19.8	20.6	17.4	14.9	16.2
6	27.0	24.9	26.1	26.7	24.6	25.8	24.7	21.6	23.1	17.6	14.7	16.3
7	27.7	24.7	26.1	25.7	22.9	24.1	23.7	22.5	23.3	16.9	15.3	16.2
8	29.4	25.9	27.4	25.2	22.8	23.9	22.3	20.6	21.5	16.5	15.1	15.8
9	26.4	23.2	24.5	25.2	23.6	24.3	22.9	19.7	21.3	16.3	13.8	15.1
10	24.7	22.4	23.5	24.5	22.2	23.4	24.0	21.2	22.6	15.6	14.0	14.9
11	24.8	22.2	23.6	22.6	20.9	21.6	26.7	22.5	24.1	15.2	14.3	15.0
12	24.3	21.5	23.0	22.9	20.9	21.8	24.9	22.8	23.5	14.1	12.3	13.1
13	24.1	20.6	22.1	24.3	21.4	22.8	25.0	22.3	23.1	15.7	11.8	13.6
14	23.2	20.7	22.0	24.8	22.1	23.2	23.4	21.4	22.1	14.9	13.1	14.1
15	23.2	19.3	21.2	24.8	23.4	24.1	25.9	23.2	23.9	14.3	14.1	14.2
16	23.3	20.1	21.6	24.3	21.6	23.0	27.4	24.2	25.9	15.5	14.1	14.5
17	25.6	21.8	23.5	24.0	22.0	23.0	26.5	25.0	25.9	18.3	14.5	16.0
18	26.9	23.7	25.2	24.5	21.8	23.2	25.2	23.3	24.3	17.7	15.2	16.6
19	28.0	25.3	26.6	23.9	21.9	22.9	24.6	22.5	23.6	15.0	10.5	12.3
20	27.3	25.1	26.3	22.9	20.2	21.6	24.2	22.4	23.4	10.7	9.2	10.0
21	27.9	24.7	26.0	22.0	21.0	21.4	23.2	21.8	22.4	10.6	9.9	10.2
22	27.9	25.1	26.3	23.9	20.8	22.2	22.9	20.5	21.5	12.2	10.0	10.9
23	25.4	23.0	24.1	23.9	21.3	22.6	21.1	19.3	20.3	13.0	10.1	11.6
24	27.6	23.0	24.9	24.0	20.6	22.3	21.6	18.2	19.9	14.6	11.7	12.9
25	26.6	23.7	25.2	23.5	21.2	22.4	20.4	18.3	19.4	13.5	12.2	12.9
26	25.3	23.8	24.6	23.8	21.5	22.4	19.0	17.4	18.3	14.8	12.2	13.3
27	25.3	22.9	24.0	25.3	22.3	23.8	17.9	15.6	16.9	13.3	11.7	12.6
28	26.7	23.7	24.8	24.6	22.8	23.7	17.5	14.7	16.2	12.4	10.7	11.6
29	24.3	20.7	22.4	25.6	22.9	24.0	19.0	14.9	16.2	10.6	9.9	10.2
30	20.8	19.1	20.1	24.3	22.6	23.3	18.5	15.8	17.1	11.7	9.2	10.4
31	---	---	---	25.1	22.3	23.7	18.9	16.9	17.9	---	---	---
MONTH	29.5	19.1	24.6	26.8	18.7	22.9	27.4	14.7	21.5	20.0	9.2	14.1

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM @ 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	640	600	620	630	610	620	880	840	860	1270	1240	1260
2	640	620	630	640	620	630	890	880	880	1310	1270	1290
3	630	560	610	630	620	630	930	890	910	1310	1300	1310
4	610	560	600	640	630	630	960	930	950	1320	1310	1320
5	600	540	580	640	630	630	960	950	960	1320	1310	1320
6	580	580	580	650	640	640	960	950	950	1370	1320	1350
7	580	580	580	650	640	640	990	950	960	1400	1360	1370
8	580	570	580	650	640	640	1020	990	1000	1430	1400	1410
9	580	570	570	650	640	640	1020	1000	1010	1470	1420	1450
10	580	570	580	650	640	640	1010	1000	1000	1470	1460	1460
11	590	580	580	650	650	650	1020	1010	1010	1520	1480	1500
12	590	580	580	660	650	650	1020	1010	1010	1530	1520	1520
13	590	580	580	660	650	650	1020	1000	1010	1540	1520	1530
14	580	580	580	660	650	660	1040	1020	1030	1540	1520	1530
15	580	580	580	660	650	660	1060	1040	1060	1550	1520	1540
16	590	580	590	660	650	660	1080	1060	1070	1560	1550	1560
17	590	580	580	660	660	660	1120	1070	1100	1560	1550	1550
18	590	580	590	660	650	650	1130	1110	1120	1560	1540	1550
19	590	580	580	670	650	660	1130	1120	1120	1550	1500	1530
20	590	580	580	670	670	670	1130	1120	1120	1510	1500	1500
21	590	580	580	710	670	690	1140	1090	1120	1510	1480	1490
22	590	580	580	730	710	720	1130	1090	1120	1480	1460	1470
23	590	590	580	730	720	730	1140	1120	1130	1460	1430	1440
24	600	590	590	770	720	740	1140	1130	1130	1430	1420	1430
25	600	590	590	780	770	770	1150	1130	1140	1430	1410	1420
26	600	590	590	780	770	780	1200	1150	1180	1420	1410	1410
27	600	590	600	780	770	770	1200	1190	1200	1420	1400	1410
28	600	590	600	780	770	780	1210	1200	1210	1410	1400	1400
29	600	590	600	830	810	820	1250	1200	1230	1410	1400	1410
30	610	600	600	850	830	840	1250	1240	1250	1400	1390	1400
31	610	600	600	---	---	---	1250	1240	1240	1400	1370	1390
MONTH	640	540	590	850	610	680	1250	840	1070	1560	1240	1440

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1360	1330	1340	990	980	980	710	630	660	770	700	740
2	1350	1340	1340	990	940	970	690	600	640	780	710	750
3	1350	1330	1340	950	940	940	680	580	630	790	730	760
4	1340	1330	1330	960	900	930	650	580	620	790	720	770
5	1360	1330	1340	950	890	910	710	600	660	780	710	750
6	1370	1350	1360	900	850	870	720	650	700	800	730	770
7	1380	1350	1370	860	850	860	720	660	690	810	750	790
8	1370	1350	1360	860	850	850	720	650	690	820	750	800
9	1360	1350	1350	850	850	850	720	650	690	830	750	790
10	1350	1340	1350	800	790	790	700	640	670	880	820	850
11	1350	1340	1350	800	790	790	710	640	680	910	830	880
12	1360	1300	1330	790	790	790	710	660	680	890	870	880
13	1330	1290	1310	790	750	760	690	630	670	890	880	880
14	1330	1290	1310	760	750	750	680	630	650	910	880	890
15	1310	1280	1290	760	750	750	690	620	660	900	880	890
16	1290	1270	1280	760	750	760	690	630	660	900	890	890
17	1280	1270	1270	760	750	750	690	620	660	910	890	900
18	1280	1250	1270	760	750	750	690	640	670	910	890	900
19	1260	1250	1260	760	750	750	690	620	660	910	890	900
20	1250	1190	1220	760	750	750	690	630	670	910	900	900
21	1210	1180	1190	770	750	750	690	620	660	910	900	910
22	1200	1130	1150	770	760	760	680	630	660	920	900	910
23	1160	1100	1120	770	760	760	700	620	660	910	890	900
24	1140	1040	1090	770	760	760	710	630	670	930	900	910
25	1090	1040	1060	710	700	710	710	650	680	930	910	920
26	1140	1040	1070	710	700	700	730	660	700	930	900	910
27	1090	1040	1060	710	660	680	740	670	710	940	900	920
28	1050	940	970	700	660	670	740	670	710	950	920	940
29	990	940	970	710	660	670	750	670	720	960	940	950
30	---	---	---	700	630	670	760	680	740	960	930	950
31	---	---	---	710	630	660	---	---	---	970	940	960
MONTH	1380	940	1240	990	630	790	760	580	670	970	700	870

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	980	960	970	1060	1020	1050	---	---	---	780	730	750
2	990	960	970	1050	1030	1040	---	---	---	790	710	740
3	---	---	---	1030	990	1020	---	---	---	770	710	720
4	---	---	---	1030	990	1010	---	---	---	780	710	730
5	---	---	---	1000	950	990	---	---	---	750	730	740
6	---	---	---	1030	980	990	---	---	---	---	---	---
7	---	---	---	1020	970	990	---	---	---	---	---	---
8	---	---	---	1030	980	1000	---	---	---	---	---	---
9	---	---	---	1020	990	1010	---	---	---	---	---	---
10	---	---	---	1030	990	1010	---	---	---	---	---	---
11	---	---	---	1030	1000	1010	---	---	---	---	---	---
12	---	---	---	1020	960	1000	---	---	---	---	---	---
13	---	---	---	990	950	970	---	---	---	---	---	---
14	---	---	---	1010	960	990	---	---	---	---	---	---
15	---	---	---	1100	1010	1030	---	---	---	---	---	---
16	---	---	---	1100	1000	1020	---	---	---	---	---	---
17	---	---	---	1020	980	1000	850	800	830	---	---	---
18	---	---	---	970	910	940	870	820	840	---	---	---
19	---	---	---	920	880	900	860	820	840	---	---	---
20	---	---	---	900	870	890	870	830	850	---	---	---
21	---	---	---	900	860	880	880	840	860	---	---	---
22	---	---	---	---	---	---	890	860	870	---	---	---
23	---	---	---	---	---	---	900	860	880	---	---	---
24	---	---	---	---	---	---	900	860	880	---	---	---
25	---	---	---	---	---	---	890	860	870	---	---	---
26	---	---	---	---	---	---	890	880	890	---	---	---
27	---	---	---	---	---	---	890	860	880	---	---	---
28	---	---	---	---	---	---	860	820	850	---	---	---
29	---	---	---	---	---	---	840	820	830	---	---	---
30	---	---	---	---	---	---	830	810	820	---	---	---
31	---	---	---	---	---	---	810	750	780	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

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 mi^2, of which about 255 mi^2 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: Oct. 27 to Nov. 16 and Nov. 27 to Mar. 30. Records poor.

AVERAGE DISCHARGE.--12 years, 8.68 ft^3/s, 6,290 acre-ft/yr; median of yearly mean discharges, 5.4 ft^3/s, 3,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/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 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge 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)
Mar. 1	----	a*20	Unknown				

No flow for several months.
a - Estimated

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	20	.51	.34	.18	.00	.02	.00
2	.00	.00	.00	.00	.00	15	.46	.41	.18	.00	.03	.00
3	.00	.00	.00	.00	.00	8.0	.41	.53	.14	.00	.02	.00
4	.00	.00	.00	.00	.00	5.0	.41	.51	.09	.00	.02	.00
5	.00	.00	.00	.00	.00	7.0	.35	.48	.08	.00	.02	.00
6	.00	.00	.00	.00	.00	6.0	.24	.39	.07	.00	.02	.00
7	.00	.00	.00	.00	.00	5.0	.24	.49	.06	.00	.02	.00
8	.00	.00	.00	.00	.00	4.0	.35	.71	.06	.00	.02	.00
9	.00	.00	.00	.00	.00	10	.33	.77	.05	.00	.01	.00
10	.00	.00	.00	.00	.00	9.0	.29	.50	.04	.00	.01	.00
11	.00	.00	.00	.00	.00	6.0	.21	.49	.03	.00	.01	.00
12	.00	.00	.00	.00	.00	4.0	.26	.53	.03	.00	.01	.00
13	.00	.00	.00	.00	.00	3.0	.28	.37	.05	2.8	.01	.00
14	.00	.00	.00	.00	.00	2.0	.21	.37	.06	13	.02	.00
15	.00	.15	.00	.00	.00	2.2	.13	.41	.06	10	.01	.00
16	.00	.10	.00	.00	.00	2.4	.18	.24	.06	4.2	.02	.00
17	.00	.06	.00	.00	.00	2.5	.29	.20	.06	1.6	.02	.00
18	.00	.06	.00	.00	.00	3.0	.24	.19	.05	.99	.02	.00
19	.00	.06	.00	.00	.00	3.5	.23	.32	.04	.64	.02	.00
20	.00	.05	.00	.00	.00	4.5	.28	.36	.04	.44	.02	.00
21	.00	.04	.00	.00	.00	3.5	.24	.47	.03	.26	.01	.00
22	.00	.04	.00	.00	.00	4.5	.31	.60	.02	.14	.01	.00
23	.00	.04	.00	.00	.00	5.0	.33	.62	.02	.11	.01	.00
24	.00	.04	.00	.00	.00	6.0	.37	.46	.02	.09	.01	.00
25	.00	.04	.00	.00	.02	5.0	.37	.47	.01	.06	.01	.00
26	.00	.03	.00	.00	.10	4.0	.39	.42	.01	.05	.00	.00
27	.00	.02	.00	.00	.50	3.0	.41	.36	.00	.04	.00	.00
28	.00	.01	.00	.00	1.0	2.0	.39	.30	.00	.03	.00	.00
29	.00	.01	.00	.00	10	1.0	.41	.25	.00	.03	.00	.00
30	.00	.00	.00	.00	---	.85	.39	.21	.00	.02	.00	.00
31	.00	---	.00	.00	---	.56	---	.20	---	.02	.00	---
TOTAL	0.00	0.75	0.00	0.00	11.62	157.51	9.51	12.97	1.54	34.52	0.40	0.00
MEAN	.00	.025	.00	.00	.40	5.08	.32	.42	.051	1.11	.013	.00
MAX	.00	.15	.00	.00	10	20	.51	.77	.18	13	.03	.00
MIN	.00	.00	.00	.00	.00	.56	.13	.19	.00	.00	.00	.00
AC-FT	.0	1.5	.0	.0	23	312	19	26	3.1	68	.8	.0

CAL YR 1987 TOTAL 6001.22 MEAN 16.4 MAX 450 MIN .00 AC-FT 11900
WTR YR 1988 TOTAL 228.82 MEAN .63 MAX 20 MIN .00 AC-FT 454

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 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
MAR 30...	1050	0.85	550	--	0.0	0.5	--	--	--	--	--
APR 12...	1300	0.26	780	8.40	15.0	11.5	300	64	34	52	26

DATE	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 DAY) (70302)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 12...	1	13	230	150	33	0.20	8.4	531	496	0.37	0.72

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 12...	2	230	20	1	43	100	0.4	<1	2	300

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 300 ft downstream from bridge 1.0 mi west of Oakes.

DRAINAGE AREA.--5,320 mi^2, of which about 3,300 mi^2 is probably noncontributing.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,280.00 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, 91.07 ft, Oct. 26; minimum, 88.11 ft, Sept. 4.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	90.56	---	---	---	---	---	90.48	89.80	89.13	88.46	88.50
2	---	90.62	---	---	---	---	---	90.25	89.67	89.19	88.49	88.48
3	90.36	90.55	---	---	---	---	---	89.74	89.63	89.24	88.51	88.27
4	90.38	90.52	---	---	---	---	---	89.62	89.72	89.07	88.54	88.18
5	90.21	90.53	---	---	---	---	---	89.72	89.83	89.38	88.75	88.29
6	90.19	90.51	---	---	---	---	---	90.06	89.84	89.66	88.87	88.52
7	90.30	90.50	---	---	---	---	---	89.99	89.69	89.38	88.97	88.81
8	90.32	90.30	---	---	---	---	---	89.69	89.49	89.06	88.66	88.63
9	---	90.46	---	---	---	---	---	89.32	89.50	89.05	88.69	88.51
10	90.30	90.59	---	---	---	---	---	89.44	89.61	88.93	88.95	88.32
11	90.49	90.60	---	---	---	---	---	89.55	89.71	88.94	88.77	88.51
12	90.46	90.59	---	---	---	---	---	---	---	89.04	88.64	88.35
13	90.51	90.55	---	---	---	---	90.13	---	---	89.10	88.60	88.49
14	90.43	90.61	---	---	---	---	90.15	89.57	89.43	89.04	88.57	88.43
15	90.44	90.54	---	---	---	---	90.22	89.51	89.59	88.96	88.64	88.46
16	90.43	90.36	---	---	---	---	90.48	89.40	89.60	89.01	88.80	88.58
17	90.59	90.34	---	---	---	---	90.03	89.63	89.72	89.10	88.70	88.53
18	90.51	90.34	---	---	---	---	90.19	89.79	89.80	88.96	88.58	88.27
19	90.51	90.30	---	---	---	---	90.28	---	89.63	88.90	88.66	88.34
20	90.42	90.21	---	---	---	---	90.06	---	89.69	88.91	88.82	88.46
21	90.52	90.15	---	---	---	---	90.16	---	89.64	88.90	88.96	88.72
22	90.45	90.12	---	---	---	---	89.99	---	89.42	88.96	88.82	88.82
23	90.52	---	---	---	---	---	89.91	---	89.60	89.08	88.67	88.97
24	90.48	---	---	---	---	---	90.10	---	89.44	88.97	88.55	89.04
25	90.82	---	---	---	---	---	89.85	89.97	---	88.84	88.46	88.83
26	90.71	---	---	---	---	---	89.70	89.65	89.38	88.91	88.61	88.85
27	90.52	---	---	---	---	---	89.84	89.56	89.56	88.95	88.56	88.81
28	90.57	---	---	---	---	---	89.89	89.65	---	89.01	88.49	88.82
29	90.57	---	---	---	---	---	89.99	89.88	---	88.86	88.51	88.86
30	90.51	---	---	---	---	---	90.10	89.95	89.15	88.68	88.62	89.29
31	90.52	---	---	---	---	---	---	89.99	---	88.72	88.58	---
MEAN	---	---	---	---	---	---	---	---	---	89.03	88.66	88.60
MAX	---	---	---	---	---	---	---	---	---	89.66	88.97	89.29
MIN	---	---	---	---	---	---	---	---	---	88.68	88.46	88.18

06470830 JAMES RIVER AT OAKES, ND

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.

REMARKS.--Long periods of missing record are the result of the monitor probes being frozen in ice or equipment failure. Because of the large percentage of missing or faulty record only daily mean values are presented and all extremes are qualified as observed or recorded.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum observed, 2,250 microsiemens, Jan. 7, 1986; minimum recorded, 290 microsiemens, Apr. 1, 1984.
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 recorded, 1,230 microsiemens, July 11; minimum recorded, 550 microsiemens, Oct. 1.
WATER TEMPERATURE: Maximum recorded, 31.7°, Aug. 15; minimum, 0.0°C, on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
06...	1500	--	600	8.47	11.0	9.0	23	11.8	100	--	220
NOV											
17...	0900	146	640	8.65	-12.0	0.0	4.3	14.6	99	--	240
JAN											
12...	1330	14	1900	7.95	-18.0	0.0	66	--	--	--	720
FEB											
25...	0900	20	1700	8.10	-15.0	0.5	1.7	20.0	136	--	630
APR											
12...	1000	182	735	8.48	20.0	7.5	15	11.1	91	4.6	280
12...	1003	--	735	--	--	7.5	--	--	--	--	--
12...	1006	--	740	--	--	7.5	--	--	--	--	--
12...	1009	--	740	--	--	7.5	--	--	--	--	--
12...	1012	--	740	--	--	7.5	--	--	--	--	--
12...	1015	--	740	--	--	7.5	--	--	--	--	--
12...	1018	--	740	--	--	7.5	--	--	--	--	--
12...	1020	--	740	--	--	7.5	--	--	--	--	--
MAY											
24...	1600	18	930	8.70	26.0	18.0	23	11.8	122	9.6	310

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											
06...	48	24	38	26	1	14	217	98	11	0.20	386
NOV											
17...	53	26	49	29	1	13	227	100	16	0.20	415
JAN											
12...	150	83	160	32	3	19	596	410	83	0.30	1230
FEB											
25...	150	61	160	35	3	16	537	390	65	0.30	1180
APR											
12...	63	31	55	29	1	11	231	160	22	0.20	478
MAY											
24...	58	40	84	36	2	14	269	170	39	0.40	591

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
NOV											
17...	394	0.56	164	10	--	<0.010	--	0.200	--	0.010	--
JAN											
12...	1260	1.67	46.5	210	--	<0.010	--	<0.100	--	0.050	--
FEB											
25...	1170	1.60	63.7	11	--	<0.010	--	0.270	--	0.100	--
APR											
12...	481	0.65	235	26	<0.010	<0.010	<0.100	<0.100	0.030	0.020	1.6
MAY											
24...	567	0.80	28.7	52	0.010	<0.010	<0.100	<0.100	0.020	0.030	0.90

DATE	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
NOV										
17...	0.80	--	0.020	--	0.016	--	2	120	--	<1
JAN										
12...	1.0	--	0.030	--	0.104	--	1	450	--	<1
FEB										
25...	0.90	--	0.100	--	0.074	--	1	390	--	<1
APR										
12...	0.80	0.160	0.050	0.054	0.026	2	2	140	1	<1
MAY										
24...	0.70	0.170	0.030	0.039	0.002	2	2	230	3	<1

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)
NOV										
17...	<1	--	11	<5	--	24	0.1	--	<1	<3
JAN										
12...	2	--	11	5	--	180	<0.1	--	<1	9
FEB										
25...	2	--	10	<5	--	53	1.4	--	<1	17
APR										
12...	1	1100	14	<5	540	410	0.1	<1	<1	<3
MAY										
24...	1	1200	4	<5	980	380	0.2	<1	<1	6

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)
NOV										
17...	--	--	--	--	--	--	--	13	5.1	97
JAN										
12...	--	--	<0.01	--	--	--	--	--	--	--
FEB										
25...	--	--	<0.01	--	--	--	--	121	6.5	10
APR										
12...	11	<0.010	<0.01	9.30	<0.100	17	1200	46	23	97
MAY										
24...	16	<0.010	<0.01	57.0	7.10	54	2400	61	3.0	99

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
APR								
12...	1000	0.0	--	7.5	735	8.48	11.1	91
12...	1003	20.0	2.0	7.5	735	--	--	--
12...	1006	40.0	2.0	7.5	740	--	--	--
12...	1009	60.0	2.0	7.5	740	--	--	--
12...	1012	80.0	2.0	7.5	740	--	--	--
12...	1015	100	2.0	7.5	740	--	--	--
12...	1018	120	2.0	7.5	740	--	--	--
12...	1020	130	2.0	7.5	740	--	--	--

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.2	9.4	12.6	7.3	6.2	6.6	.8	.3	.5	.1	.0	.0
2	10.7	6.6	8.6	8.6	7.3	8.1	.7	.3	.5	.1	.0	.0
3	10.6	7.5	9.2	8.7	8.0	8.4	.6	.3	.5	.1	.0	.0
4	12.8	9.0	10.7	8.3	6.0	7.3	.6	.2	.4	.1	.0	.0
5	11.3	9.0	9.9	6.4	4.4	5.4	.5	.2	.3	.0	.0	.0
6	9.1	7.5	8.3	5.8	3.9	5.0	.5	.2	.3	.0	.0	.0
7	9.2	6.1	7.6	5.1	3.8	4.5	.5	.2	.4	.0	.0	.0
8	9.2	6.9	8.0	4.0	1.2	2.4	.9	.2	.5	.0	.0	.0
9	6.7	4.1	5.2	1.9	.6	1.3	.9	.3	.6	.0	.0	.0
10	6.2	3.5	4.8	1.3	.3	.9	.7	.2	.5	.0	.0	.0
11	6.3	3.2	4.8	2.2	.1	1.0	.6	.2	.4	.0	.0	.0
12	7.9	4.6	6.1	3.3	1.6	2.4	.4	.1	.3	---	---	---
13	8.5	6.5	7.3	3.8	2.1	2.9	.2	.0	.2	---	---	---
14	8.2	6.6	7.4	3.8	2.6	3.2	.2	.0	.1	---	---	---
15	7.8	7.3	7.6	4.6	3.8	4.2	.2	.0	.1	---	---	---
16	7.5	6.6	7.2	4.3	1.6	3.0	.2	.0	.1	---	---	---
17	7.6	5.2	6.4	1.3	.0	.6	.3	.0	.1	---	---	---
18	7.0	5.1	6.1	1.2	.1	.6	.3	.0	.1	---	---	---
19	5.8	4.2	5.1	.8	.0	.3	.3	.0	.1	---	---	---
20	4.4	3.2	3.7	1.3	.2	.6	.3	.0	.1	---	---	---
21	3.0	1.9	2.5	1.2	.2	.7	.2	.0	.1	---	---	---
22	2.2	1.0	1.7	1.5	.3	.8	.3	.0	.1	---	---	---
23	3.5	1.6	2.3	1.7	.3	1.0	.3	.0	.1	---	---	---
24	2.3	1.0	1.6	1.4	.5	.9	.3	.0	.1	---	---	---
25	3.5	1.2	2.2	1.0	.5	.7	.4	.0	.2	---	---	---
26	5.5	3.4	4.3	.9	.4	.7	.5	.0	.2	---	---	---
27	4.8	2.8	3.9	.9	.4	.7	.3	.0	.2	---	---	---
28	5.1	3.1	4.1	.8	.4	.6	.3	.0	.1	---	---	---
29	5.6	3.3	4.5	.7	.2	.5	.3	.0	.1	---	---	---
30	6.2	4.2	5.2	.7	.3	.5	.1	.0	.0	---	---	---
31	6.7	4.5	5.6	---	---	---	.1	.0	.0	---	---	---
MONTH	14.2	1.0	6.0	8.7	.0	2.5	.9	.0	.2	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	16.9	14.9	15.8
2							---	---	---	15.6	14.4	15.0
3							---	---	---	14.9	11.8	13.3
4							---	---	---	14.4	9.3	11.9
5							---	---	---	16.2	10.7	13.4
6							---	---	---	16.5	14.3	15.4
7							---	---	---	15.9	13.8	14.8
8							---	---	---	16.5	13.2	14.5
9							---	---	---	14.6	9.3	12.1
10							---	---	---	16.6	13.1	14.6
11							---	---	---	18.4	14.5	16.3
12							---	---	---	19.1	12.5	16.9
13							11.8	8.9	10.4	15.4	8.4	12.1
14							10.6	7.0	8.8	16.7	12.0	14.3
15							11.3	6.4	8.7	15.1	11.7	13.6
16							11.7	7.5	9.6	17.3	9.9	13.4
17							10.9	7.5	9.1	18.7	13.3	15.8
18							10.1	5.4	7.6	18.8	14.9	16.9
19							10.6	6.2	8.4	17.4	16.2	16.7
20							10.1	6.2	8.5	18.2	15.2	16.6
21							9.3	7.4	8.4	17.2	13.4	15.0
22							9.4	6.1	7.8	15.1	12.0	13.3
23							10.5	4.5	7.4	19.3	13.6	15.7
24							11.8	7.0	9.3	20.7	17.4	18.9
25							10.8	6.1	8.6	19.6	16.1	18.3
26							8.9	6.0	7.1	22.1	17.5	19.2
27							11.4	4.4	7.6	22.7	18.9	20.4
28							14.2	7.3	10.5	24.1	20.4	22.0
29							16.5	10.3	13.3	25.1	20.2	22.6
30							18.2	13.5	15.8	23.8	19.4	22.0
31							---	---	---	25.0	20.6	22.7
MONTH							---	---	---	25.1	8.4	16.2

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.7	21.0	22.7	21.4	18.6	20.0	29.7	20.1	22.7	24.7	16.3	19.6
2	27.9	21.1	23.8	25.8	17.8	21.5	29.2	19.0	23.5	21.0	14.2	17.2
3	28.4	23.1	25.6	25.9	19.7	23.0	25.3	18.9	22.7	20.4	12.6	16.0
4	29.1	24.4	26.8	28.8	22.0	25.2	21.1	17.6	19.6	20.9	11.6	15.6
5	27.5	23.9	25.6	29.2	22.8	26.0	26.5	15.7	20.9	21.6	9.2	15.2
6	25.3	21.0	23.3	28.0	24.1	26.0	28.7	19.3	23.6	22.4	10.5	16.0
7	27.2	20.9	23.9	25.4	20.1	23.0	24.8	20.3	22.7	18.3	11.8	15.6
8	28.1	22.8	25.4	27.9	20.7	23.9	25.3	17.1	20.6	18.0	12.4	14.8
9	23.5	18.1	20.9	26.5	22.6	24.3	27.1	17.2	21.8	19.8	9.5	14.6
10	23.6	17.9	20.8	26.1	20.2	22.8	27.6	19.8	23.4	17.7	11.1	14.4
11	23.5	18.3	21.0	27.0	18.4	22.2	30.1	21.7	25.4	17.5	13.3	16.2
12	21.8	18.7	20.7	---	---	---	29.1	20.1	24.6	17.0	10.4	12.9
13	24.0	17.7	20.4	---	---	---	25.6	21.7	23.3	19.7	7.8	13.5
14	22.5	18.9	20.7	27.5	21.3	24.0	29.6	19.8	24.2	17.2	10.7	14.5
15	22.2	16.4	18.9	26.2	22.6	24.5	31.7	22.2	26.5	15.4	14.0	14.4
16	23.5	17.7	20.3	27.1	19.6	23.0	30.3	24.3	27.2	20.2	13.8	16.0
17	26.7	20.4	23.0	25.9	20.3	23.2	29.6	23.2	25.8	22.3	13.3	17.8
18	26.4	22.0	24.3	27.7	19.7	23.8	26.5	21.7	23.9	20.6	13.0	16.8
19	28.0	23.6	25.7	25.7	20.2	22.9	27.3	19.9	23.3	12.4	8.1	9.6
20	27.6	22.9	25.2	24.8	16.8	21.0	25.3	20.0	22.7	14.2	6.7	10.1
21	29.3	23.4	26.0	26.9	18.9	22.2	22.9	20.8	21.8	12.6	9.4	10.9
22	27.2	22.8	25.1	27.0	20.9	24.1	25.4	18.6	21.3	15.1	10.5	12.2
23	24.5	19.9	22.7	26.4	19.5	22.8	22.2	16.3	19.1	16.5	8.4	12.2
24	27.9	21.1	24.2	27.6	19.2	23.3	24.7	15.2	19.4	17.7	11.2	14.0
25	27.3	20.9	24.2	28.4	20.2	24.1	22.1	14.7	18.3	16.1	10.7	13.6
27	26.2	20.6	23.7	29.6	21.5	25.3	20.3	12.1	15.8	13.8	8.7	11.6
28	26.6	22.0	24.1	25.1	21.0	23.1	20.5	10.8	15.7	11.8	9.2	10.1
29	22.3	17.8	19.7	28.6	21.4	24.6	23.0	11.4	17.2	10.9	8.7	9.8
30	22.8	15.6	19.0	29.5	20.7	25.0	22.7	14.5	18.7	14.1	8.5	10.9
31	---	---	---	28.5	21.6	25.0	22.8	16.8	19.4	---	---	---
MONTH	29.3	15.6	23.1	---	---	---	31.7	10.8	21.7	24.7	6.7	14.0

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	580	550	570	610	600	600	710	690	700			
2	590	560	580	600	590	600	720	700	710			
3	580	570	580	600	590	600	730	710	720			
4	590	570	580	610	590	600	740	720	730			
5	610	580	600	610	600	610	780	740	760			
6	620	600	610	620	610	610	810	780	790			
7	620	600	610	620	610	610	840	810	830			
8	620	610	610	630	610	620	870	840	850			
9	630	610	620	630	620	630	880	870	870			
10	630	620	620	640	620	630	890	880	880			
11	630	620	620	640	620	630	900	890	900			
12	630	610	620	630	620	630	910	900	900			
13	630	610	620	630	620	630	920	910	910			
14	620	610	620	630	620	620	930	920	920			
15	620	610	620	630	620	620	930	920	930			
16	620	610	620	630	620	620	940	930	930			
17	630	610	620	640	630	630	950	930	940			
18	620	620	620	640	630	630	960	940	950			
19	630	620	620	640	630	640	990	960	970			
20	630	620	620	640	630	630	1020	990	1000			
21	630	620	630	650	640	640	1040	1020	1030			
22	640	620	630	650	640	650	1060	1040	1050			
23	640	630	630	660	650	650	1080	1060	1070			
24	640	620	630	660	650	660	1090	1070	1080			
25	640	620	630	670	660	660	1090	1080	1090			
26	630	610	620	670	660	670	1100	1080	1090			
27	640	620	630	680	670	670	1110	1090	1100			
28	640	620	630	690	670	680	1120	1100	1110			
29	630	620	630	700	680	690	1130	1120	1120			
30	620	610	620	700	690	690	1140	1120	1130			
31	620	600	610	---	---	---	1150	1130	1140			
MONTH	640	550	620	700	590	630	1150	690	940			

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	680	660	670
2							---	---	---	690	670	680
3							---	---	---	690	670	680
4							---	---	---	700	680	690
5							---	---	---	720	690	710
6							---	---	---	740	700	720
7							---	---	---	730	720	720
8							---	---	---	740	720	730
9							---	---	---	760	720	740
10							---	---	---	760	730	740
11							---	---	---	760	740	750
12							---	---	---	770	740	750
13							730	700	710	770	740	760
14							730	690	710	760	740	750
15							720	680	700	750	730	740
16							700	670	690	760	730	740
17							690	670	680	750	740	750
18							690	660	680	780	750	760
19							690	660	670	810	780	790
20							700	660	680	840	810	820
21							710	680	690	880	840	860
22							720	690	710	900	880	890
23							730	680	700	930	900	910
24							710	680	700	950	920	930
25							720	690	700	970	940	950
26							720	700	710	980	960	970
27							730	690	710	1010	970	990
28							710	670	690	1030	980	1000
29							680	660	670	1020	970	1010
30							680	660	670	990	920	950
31							---	---	---	930	910	920
MONTH							---	---	---	1030	660	810

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	920	900	910	1090	1070	1070	1130	1080	1100	990	950	970
2	1000	920	970	1130	1080	1100	1080	1010	1050	1000	960	980
3	960	930	940	1160	1110	1130	1040	1000	1020	1010	970	990
4	960	930	940	1180	1120	1150	1020	990	1010	1040	980	1000
5	960	930	950	1190	1160	1170	1020	980	1000	1050	1000	1020
6	970	930	950	1160	1070	1100	1010	970	990	1070	1010	1040
7	970	940	960	1070	1030	1040	1050	950	1010	1060	1020	1040
8	950	930	940	1110	1030	1050	950	900	930	1040	1030	1030
9	970	940	950	1170	1110	1140	950	900	910	1060	1020	1040
10	990	940	960	1220	1160	1180	980	920	950	1030	1010	1020
11	980	940	960	1230	1180	1200	960	900	940	1050	1010	1040
12	950	930	940	---	---	---	960	890	930	1020	970	1010
13	950	920	940	---	---	---	940	890	910	1010	970	990
14	930	880	900	1070	1030	1050	930	890	910	970	950	960
15	940	890	920	1080	1020	1050	950	900	920	960	940	950
16	980	930	950	1080	1060	1070	960	910	940	990	930	960
17	1000	960	980	1070	1020	1050	940	890	920	960	930	940
18	1010	960	980	1020	970	1010	910	870	890	930	860	910
19	1010	980	1000	970	930	950	900	860	880	860	760	790
20	1000	960	980	980	920	950	910	870	890	820	770	790
21	990	960	980	1010	960	980	930	880	900	840	820	830
22	980	950	970	990	950	970	940	900	910	840	810	830
23	970	940	950	990	950	960	910	890	900	870	840	850
24	970	950	960	1020	960	990	930	880	900	870	850	860
25	1020	950	970	1010	970	990	930	890	910	870	850	860
26	1020	990	1010	1030	980	1000	940	900	920	870	840	860
27	1050	1000	1030	1050	1000	1020	940	910	930	900	860	870
28	1060	1030	1040	1060	1020	1040	950	910	930	910	850	880
29	1070	1040	1050	1080	1030	1060	960	920	930	870	850	860
30	1090	1060	1070	1120	1060	1080	980	920	950	890	870	880
31	---	---	---	1140	1080	1110	970	940	950	---	---	---
MONTH	1090	880	970	---	---	---	1130	860	940	1070	760	930

06470875 JAMES RIVER AT DAKOTA LAKE DAM NR 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 mi^2, of which about 3,300 mi^2 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: Jan. 7 to Feb. 1. Records good except those below 10 ft^3/s, which are fair. Flow regulated by upstream reservoirs, Jamestown Reservoir (station 06469000), Pipestem Lake, capacity 147,000 acre-ft, and Lake LaMoure.

AVERAGE DISCHARGE.--7 years, 161 ft^3/s, 116,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 2,300 ft^3/s, Mar. 28, 1987, gage height, 13.76 ft, no flow at times during some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 360 ft^3/s, Oct. 5, gage height, 10.22 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	196	219	70	30	14	32	153	7.5	.00	.00	.00	.00
2	149	211	64	30	15	32	163	.74	2.8	.00	.00	.00
3	89	238	64	30	15	32	155	80	16	.00	.00	.00
4	177	250	62	28	15	35	177	99	5.2	.00	.00	.00
5	266	228	60	28	15	35	180	44	1.2	.00	.00	.00
6	199	225	60	25	15	37	118	10	.00	.00	.00	.00
7	174	231	58	20	15	43	120	.01	.00	.00	.00	.00
8	208	249	57	20	14	56	145	65	4.2	.00	.00	.00
9	245	200	57	16	14	69	184	147	.04	.00	.00	.00
10	177	171	55	14	15	76	119	29	.00	.00	.00	.00
11	159	196	63	12	15	85	81	9.6	.00	.00	.00	.00
12	203	217	65	11	15	91	137	47	3.3	.00	.00	.00
13	208	224	57	11	15	97	196	15	.08	.00	.00	.00
14	228	197	56	11	13	110	173	.02	3.1	.00	.00	.00
15	230	251	54	11	11	120	153	44	3.2	.47	.00	.00
16	235	311	51	11	9.6	120	98	6.1	1.4	.00	.00	.00
17	193	256	46	11	9.6	120	244	.00	.24	.00	.00	.00
18	233	181	45	11	9.6	123	150	.00	.03	.00	.00	.00
19	228	172	45	11	12	131	147	1.1	8.5	.00	.00	23
20	248	154	45	11	14	128	199	15	3.0	.00	.00	.00
21	195	137	44	10	12	132	145	42	1.2	.00	.00	.00
22	230	122	43	10	16	134	180	59	5.9	.00	.00	.00
23	222	110	43	10	17	136	134	7.8	.32	.00	.00	.00
24	224	96	43	10	18	136	76	3.1	1.1	.00	.00	.00
25	109	94	40	10	19	142	140	.00	2.8	.00	.00	.00
26	222	79	38	10	19	149	133	6.5	.00	.00	.00	.00
27	248	79	37	10	20	148	74	9.9	.00	.00	.00	.00
28	214	79	37	10	22	153	54	11	.00	.00	.00	.00
29	216	78	34	10	26	149	25	.00	.00	.00	.00	.00
30	231	75	30	11	---	159	.83	.00	.00	.00	.00	.00
31	230	---	30	12	---	159	---	.00	---	.00	.00	---
TOTAL	6386	5330	1553	465	439.8	3169	4053.83	759.37	63.61	0.47	0.00	23.00
MEAN	206	178	50.1	15.0	15.2	102	135	24.5	2.12	.015	.00	.77
MAX	266	311	70	30	26	159	244	147	16	.47	.00	23
MIN	89	75	30	10	9.6	32	.83	.00	.00	.00	.00	.00

CAL YR 1987 TOTAL 118520 MEAN 325 MAX 2210 MIN 30
WTR YR 1988 TOTAL 22243.08 MEAN 60.8 MAX 311 MIN .00

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.--
WATER TEMPERATURE: October 1982 to current year.
SPECIFIC CONDUCTANCE: October 1982 to current year.
DISSOLVED OXYGEN: October 1982 to current year.
PH: June 1983 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 July 1 through Sept. 30.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 31.0°C, July 31, 1987; minimum, 0.0°C, several days during winter months each year.
SPECIFIC CONDUCTANCE: Maximum recorded, 2,620 microsiemens, Feb. 28, 1986; minimum recorded, 217 microsiemens, July 13, 1983.
DISSOLVED OXYGEN: Maximum recorded, greater than 20 mg/L on many days; minimum recorded, 0.5 mg/L, June 5, 1988.
PH: Maximum recorded, 9.7 units, Oct. 10, 1984; minimum recorded, 6.0 units, Nov. 20, 1984.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 29.0°C, June 3,4,8,20; minimum, 0.0°C, several days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 2,170 microsiemens, Feb. 26; minimum recorded, 500 microsiemens, Oct. 21,22.
DISSOLVED OXYGEN: Maximum recorded, greater than 20 mg/L on many days; minimum recorded, 0.5 mg/L, June 5.
PH: Maximum recorded, 9.2 units, Oct. 1,3,4,5; minimum recorded, 8.1 units, Mar. 1-4.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT												
06...	1200	175	600	8.85	10.0	8.0	14	11.3	94	--	230	52
NOV												
16...	1400	311	640	8.88	0.0	3.0	3.0	15.0	110	--	240	52
JAN												
11...	1430	12	1200	8.55	-15.0	2.5	2.5	>20.0	--	--	430	83
FEB												
24...	1300	19	2300	7.88	-15.0	3.0	2.7	20.0	146	--	760	140
MAR												
30...	1250	144	--	--	0.0	2.0	--	--	--	--	--	--
APR												
11...	1600	50	580	8.65	21.0	10.0	35	11.5	100	5.9	210	48
MAY												
23...	1500	11	810	8.80	28.0	18.0	18	13.4	139	5.1	290	61
AUG												
23...	0900	0.0	1140	9.10	20.0	19.0	--	2.2	23	--	--	--

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)	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												
06...	25	41	26	1	13	220	94	11	0.20	379	368	0.52
NOV												
16...	26	49	30	1	12	222	110	16	0.20	406	399	0.55
JAN												
11...	53	110	35	2	18	386	240	59	0.30	805	795	1.09
FEB												
24...	100	260	42	4	27	680	570	150	0.30	1630	1660	2.22
APR												
11...	23	45	30	1	9.8	177	110	17	0.20	359	359	0.49
MAY												
23...	33	66	32	2	15	243	170	23	0.30	521	514	0.71

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	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)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)
OCT 06...	179	30	--	<0.010	--	<0.100	--	<0.010	--	0.40	--	0.030
NOV 16...	341	10	--	<0.010	--	0.150	--	0.010	--	0.40	--	0.020
JAN 11...	26.5	4	--	<0.010	--	<0.100	--	0.030	--	1.0	--	0.050
FEB 24...	81.9	9	--	<0.010	--	<0.100	--	0.020	--	1.3	--	0.030
APR 11...	48.7	40	0.010	<0.010	<0.100	<0.100	0.030	0.020	1.3	0.60	0.220	0.020
MAY 23...	15.9	11	0.020	<0.010	<0.100	<0.100	0.030	0.030	1.0	0.80	0.160	0.020

DATE	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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)
OCT 06...	--	0.016	--	3	100	--	<1	2	--	6	<5	--
NOV 16...	--	0.002	--	2	120	--	<1	<1	--	7	<5	--
JAN 11...	--	0.042	--	1	240	--	<1	2	--	7	<5	--
FEB 24...	--	<0.002	--	1	550	--	<10	1	--	30	<5	--
APR 11...	0.046	0.003	2	1	100	1	<1	1	2000	5	<5	490
MAY 23...	0.024	0.001	2	2	160	2	<1	1	840	6	<5	380

DATE	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)	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)
OCT 06...	5	<0.1	--	2	<3	--	--	<0.01	--	--	--	--
NOV 16...	8	0.1	--	<1	4	--	--	--	--	--	--	--
JAN 11...	70	<0.1	--	<1	<3	--	--	<0.01	--	--	--	--
FEB 24...	60	<0.1	--	<1	10	--	--	<0.01	--	--	--	--
APR 11...	140	0.2	<1	<1	<3	13	<0.010	<0.01	30.0	1.50	26	1200
MAY 23...	11	0.2	<1	<1	6	15	<0.010	<0.01	15.0	2.10	20	1200

DATE	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)	ALDRIN, DIS-SOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AME-TRYNE TOTAL (82184)	ATRA-ZINE, TOTAL (UG/L) (39630)	GUTHION TOTAL (UG/L) (39580)	SEVIN, TOTAL (UG/L) (39750)	CHLOR-DANE, DIS-SOLVED (UG/L) (39352)	CHLOR-DANE, TOTAL (UG/L) (39350)	CYAN-AZINE TOTAL (UG/L) (81757)
OCT 06...	29	14	98	--	--	--	--	--	--	--	--	--
NOV 16...	17	14	97	--	--	--	--	--	--	--	--	--
JAN 11...	35	1.2	24	--	--	--	--	--	--	--	--	--
FEB 24...	73	3.7	23	--	--	--	--	--	--	--	--	--
APR 11...	101	14	100	--	--	--	--	--	--	--	--	--
MAY 23...	35	1.1	98	<0.01	<0.010	<0.10	0.20	<0.10	<0.50	<0.1	<0.1	0.20
AUG 23...	--	--	--	<0.01	<0.010	<0.10	0.20	<0.10	<0.50	<0.1	<0.1	0.40

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	DDD, DISSOLVED (UG/L) (39361)	DDD, TOTAL (UG/L) (39360)	DDE, DISSOLVED (UG/L) (39366)	DDE, TOTAL (UG/L) (39365)	DDT, DISSOLVED (UG/L) (39371)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, DISSOLVED (UG/L) (39572)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN DISSOLVED (UG/L) (39381)	DI-ELDRIN TOTAL (UG/L) (39380)	DYPHONATE TOTAL (UG/L) [a](LC1336)	ENDOSULFAN DISSOLV (UG/L) (82354)	ENDOSULFAN, TOTAL (UG/L) (39388)
MAY													
23...	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.010
AUG													
23...	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.010

DATE	ENDRIN, DISSOLVED (UG/L) (39391)	ETHION DISSOLV (UG/L) (82346)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTACHLOR, DISSOLVED (UG/L) (39411)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE DISSOLVED (UG/L) (39421)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE DISSOLVED (UG/L) (39341)	LINDANE TOTAL (UG/L) (39340)	MALATHION, DISSOLVED (UG/L) (39532)	MALATHION, TOTAL (UG/L) (39530)
MAY												
23...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01
AUG												
23...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01

DATE	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)	MIREX, DISSOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	METHYL TRITHION, TOTAL (UG/L) (39790)	METHYL-TRITHION DISSOLV (UG/L) (82344)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PARATHION, DISSOLVED (UG/L) (39542)
MAY											
23...	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01
AUG											
23...	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01

DATE	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)	PROMETRYNE TOTAL (UG/L) (39057)	PROPHAM TOTAL (UG/L) (39052)	PROPAZINE TOTAL (UG/L) (39024)
MAY											
23...	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1	<0.1	<0.5	<0.10
AUG											
23...	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.01	<0.1	<0.1	<0.5	<0.10

DATE	SIMAZINE TOTAL (UG/L) (39055)	SIMETRYNE TOTAL (UG/L) (39054)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOXAPHENE, DISSOLVED (UG/L) (39401)	TOXAPHENE, TOTAL (UG/L) [a](39400)	TREFLAN TOTAL (UG/L) (LC1337)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)	TRITHION DISSOLV (UG/L) (82342)	TOTAL TRITHION (UG/L) (39786)
MAY												
23...	<0.10	<0.1	0.07	<0.01	<0.01	<0.01	<1.0	<1	<0.050	<0.10	<0.01	<0.01
AUG												
23...	<0.10	<0.1	<0.01	<0.01	<0.01	<0.01	<1.0	<1	<0.050	<0.10	<0.01	<0.01

a - Lab Code. WATSTORE parameter code unavailable.

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
APR								
11...	1515	0.0	0.50	10.0	585	--	--	--
11...	1516	10.0	0.50	10.0	590	--	--	--
11...	1517	20.0	0.50	10.0	585	--	--	--
11...	1518	30.0	0.50	10.0	580	--	--	--
11...	1519	40.0	0.50	10.0	580	--	--	--
11...	1520	50.0	0.50	10.0	580	--	--	--
11...	1521	60.0	0.50	10.0	585	--	--	--
11...	1522	70.0	0.50	10.0	580	--	--	--
11...	1523	80.0	0.50	10.0	580	--	--	--
11...	1524	90.0	0.50	10.0	580	--	--	--
11...	1525	100	0.50	10.0	580	--	--	--
11...	1600	--	--	10.0	580	8.65	11.5	100

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	---	---	7.5	6.0	6.5	2.5	1.5	2.0	3.0	2.5	2.5
2	11.0	8.5	9.5	8.5	7.0	8.0	2.5	2.0	2.0	3.0	2.5	2.5
3	11.0	8.5	9.5	9.0	8.0	8.5	2.0	1.5	1.5	3.0	2.5	3.0
4	12.5	10.0	11.0	8.5	7.0	8.0	2.5	2.0	2.5	3.0	2.5	2.5
5	11.5	9.5	10.0	7.0	5.5	6.0	3.0	2.5	3.0	3.0	2.5	2.5
6	9.0	8.0	8.5	6.0	5.0	5.5	3.0	2.5	3.0	2.5	2.5	2.5
7	9.0	7.0	7.5	6.0	4.5	5.5	3.0	3.0	3.0	2.5	2.0	2.5
8	9.0	7.5	8.0	5.5	2.5	3.5	3.0	2.5	3.0	3.0	2.5	2.5
9	7.5	5.0	5.5	3.0	2.0	2.5	3.5	2.5	3.0	3.0	2.5	2.5
10	6.0	4.0	5.0	3.0	2.5	3.0	3.5	2.5	3.0	2.5	2.0	2.5
11	6.0	4.0	5.0	3.0	1.0	2.0	2.5	1.5	2.0	2.5	2.0	2.5
12	7.0	5.0	6.0	3.5	2.0	3.0	1.5	.5	1.0	3.0	2.0	2.0
13	8.0	6.5	7.0	3.5	2.5	3.0	1.0	.5	1.0	3.0	2.5	2.5
14	7.5	6.5	7.0	4.0	3.0	3.5	1.5	1.0	1.0	2.5	2.0	2.5
15	7.5	7.0	7.5	5.0	4.0	4.5	2.0	1.5	1.5	3.0	2.5	2.5
16	7.5	7.0	7.5	3.0	2.0	3.0	2.5	2.0	2.0	3.0	2.5	2.5
17	8.0	6.0	7.0	2.0	.0	1.0	3.0	2.5	2.5	3.5	2.5	3.0
18	7.5	6.0	6.5	2.5	1.5	2.0	3.5	2.5	3.0	3.0	3.0	3.0
19	6.5	5.0	5.5	3.0	2.0	2.0	3.5	3.0	3.0	3.0	2.5	3.0
20	---	---	---	3.5	2.5	3.0	3.5	3.0	3.0	3.0	2.5	3.0
21	3.5	2.5	3.0	3.5	3.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0
22	3.0	1.5	2.0	3.5	3.0	3.5	3.5	3.0	3.5	3.0	3.0	3.0
23	3.0	2.0	2.5	4.0	3.0	3.5	3.5	3.0	3.5	3.0	2.5	3.0
24	2.5	1.5	2.0	4.0	3.0	3.5	3.5	3.0	3.0	3.0	2.0	2.5
25	3.5	1.5	2.5	4.0	3.0	4.0	3.5	3.0	3.5	3.0	2.0	2.5
26	5.5	3.5	4.5	4.5	3.5	4.0	3.5	3.0	3.5	2.5	2.0	2.5
27	4.5	3.0	4.0	4.5	3.0	3.5	3.5	3.0	3.5	2.5	2.0	2.5
28	4.5	3.5	4.0	3.5	3.0	3.5	3.5	3.0	3.0	2.5	2.0	2.5
29	5.5	4.0	4.5	3.0	1.5	2.0	3.5	3.0	3.5	3.0	2.5	2.5
30	6.0	4.5	5.0	2.0	1.5	1.5	3.5	2.5	3.0	2.5	2.0	2.5
31	6.0	4.5	5.5	---	---	---	3.0	2.0	2.5	2.5	2.0	2.5
MONTH	---	---	---	9.0	.0	3.9	3.5	.5	2.6	3.5	2.0	2.6

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.0	2.5	2.5	4.0	3.5	4.0	---	---	---	16.5	15.0	16.0
2	---	---	---	3.5	3.5	3.5	---	---	---	16.0	14.5	15.0
3	2.5	2.0	2.5	3.5	3.0	3.5	---	---	---	15.0	12.5	13.5
4	2.0	2.0	2.0	3.0	3.0	3.0	---	---	---	---	---	---
5	2.0	1.5	1.5	3.0	2.5	3.0	---	---	---	15.5	12.0	13.5
6	1.5	1.5	1.5	3.0	2.5	2.5	---	---	---	---	---	---
7	1.5	1.5	1.5	3.0	2.0	2.5	---	---	---	---	---	---
8	1.5	1.5	1.5	2.0	1.5	1.5	---	---	---	17.0	14.0	15.0
9	1.5	1.5	1.5	2.5	2.0	2.0	10.5	10.5	10.5	---	---	---
10	1.5	1.0	1.5	2.0	1.5	2.0	10.0	10.0	10.0	17.0	13.0	15.0
11	1.0	1.0	1.0	1.5	.5	1.0	---	---	---	19.5	15.0	17.0
12	1.0	1.0	1.0	1.0	.5	.5	12.0	9.5	11.5	---	---	---
13	1.0	1.0	1.0	1.5	.5	1.0	11.5	9.0	10.5	---	---	---
14	1.0	1.0	1.0	1.0	.5	1.0	10.0	7.5	9.0	---	---	---
15	1.5	1.0	1.0	1.0	.5	1.0	---	8.0	---	16.0	13.5	15.0
16	1.5	1.0	1.5	1.5	---	1.0	---	---	---	18.5	12.0	14.5
17	2.0	1.0	1.5	1.5	1.0	1.5	11.0	---	9.5	18.0	14.0	16.0
18	2.0	1.5	1.5	1.5	1.0	1.5	---	---	---	19.0	15.5	17.5
19	2.5	1.5	2.0	1.5	1.0	1.5	---	---	---	18.5	17.0	17.5
20	3.0	1.5	2.0	1.5	1.0	1.0	10.0	7.0	8.5	---	---	---
21	3.0	2.0	2.5	2.0	1.0	1.5	8.5	8.0	8.5	17.5	14.0	16.0
22	3.0	2.5	2.5	1.5	1.0	1.5	---	---	---	14.5	13.0	14.0
23	3.0	2.5	2.5	1.5	1.0	1.5	---	---	---	20.0	16.5	19.0
24	---	2.5	3.0	1.5	1.0	1.5	---	---	---	23.5	17.5	20.0
25	3.5	3.0	3.5	1.5	.5	1.0	---	---	---	21.5	18.0	20.0
26	---	---	---	1.5	.0	1.0	9.0	6.5	7.5	26.0	19.0	21.5
27	---	---	---	---	---	---	10.0	5.5	7.5	25.0	19.0	22.0
28	4.0	3.5	3.5	2.0	.5	1.5	11.0	7.5	9.0	25.0	21.5	23.0
29	4.0	3.5	4.0	2.0	.5	1.0	---	---	---	25.0	22.0	23.5
30	---	---	---	---	---	---	---	---	---	24.0	21.5	22.5
31	---	---	---	---	---	---	---	---	---	25.0	21.5	23.0
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	25.5	22.5	23.5									
2	---	---	---									
3	29.0	22.5	25.5									
4	29.0	25.0	27.0									
5	27.5	24.0	26.0									
6	26.0	22.5	24.5									
7	28.0	23.0	25.5									
8	29.0	24.5	26.5									
9	24.5	21.5	23.0									
10	24.0	20.5	22.5									
11	23.5	20.0	22.0									
12	22.5	20.5	22.0									
13	22.0	19.5	20.5									
14	23.0	20.5	21.5									
15	22.5	19.0	21.0									
16	25.0	16.5	22.0									
17	28.0	21.0	24.5									
18	27.5	23.5	25.5									
19	28.5	24.5	26.0									
20	29.0	25.0	27.0									
21	28.5	25.0	26.5									
22	28.0	24.0	26.0									
23	---	---	---									
24	27.5	22.5	24.5									
25	27.0	23.5	25.0									
26	28.5	23.5	26.0									
27	27.5	23.5	25.5									
28	25.5	23.5	24.0									
29	21.0	16.5	19.5									
30	21.5	17.5	19.0									
31	---	---	---									
MONTH	---	---	---									

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	650	550	620	590	580	580	630	620	630	890	850	870
2	590	550	570	590	510	590	640	620	630	920	880	900
3	590	550	570	590	570	590	640	630	630	930	910	920
4	580	550	570	590	580	590	650	630	640	960	920	940
5	580	550	570	590	580	590	660	640	650	990	960	970
6	590	580	580	590	580	590	670	660	660	1010	980	1000
7	590	580	580	620	530	590	670	650	660	1040	1010	1020
8	600	580	590	610	570	600	670	650	660	1070	1030	1060
9	620	590	610	620	570	610	670	650	660	1110	1070	1080
10	620	600	610	640	600	610	660	650	660	1130	1100	1110
11	610	590	600	610	600	610	660	650	650	1140	1120	1130
12	610	600	610	610	600	610	650	650	650	1170	1120	1140
13	600	590	600	620	570	610	680	660	670	1190	1150	1170
14	590	570	580	610	610	610	690	670	680	1200	1180	1190
15	570	560	560	610	610	610	690	680	690	1220	1200	1210
16	560	550	560	610	580	600	720	690	710	1220	1210	1220
17	570	560	560	610	590	600	740	710	720	1230	1210	1220
18	570	560	560	610	560	600	740	720	730	1230	1220	1230
19	570	550	560	620	590	610	760	740	750	1230	1220	1230
20	---	---	---	630	600	620	760	740	750	1230	1210	1220
21	570	500	560	640	600	620	770	760	770	1240	1230	1230
22	570	500	560	640	590	630	780	760	770	1240	1230	1240
23	570	540	560	640	610	630	790	770	780	1240	1230	1240
24	570	560	570	640	590	630	810	790	800	1250	1230	1240
25	580	560	570	640	570	630	820	800	810	1280	1230	1260
26	580	530	570	660	600	630	830	810	820	1290	1250	1270
27	580	570	580	650	620	640	840	820	830	1320	1290	1300
28	580	570	580	650	620	640	850	840	840	1330	1310	1320
29	580	580	580	630	620	630	850	830	840	1350	1320	1330
30	580	570	580	630	620	620	840	830	830	1340	1320	1340
31	590	570	580	---	---	---	850	830	840	1340	1310	1330
MONTH	---	---	---	660	510	610	850	620	720	1350	850	1160

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1370	1320	1350	2050	1960	2000	---	---	---	760	740	750
2	---	---	---	1970	1900	1940	---	---	---	760	750	750
3	1430	1390	1410	1900	1750	1830	---	---	---	760	740	750
4	1480	1430	1450	1750	1620	1700	---	---	---	---	---	---
5	1510	1470	1500	1630	1480	1550	---	---	---	760	740	750
6	1560	1510	1530	1480	1380	1420	---	---	---	---	---	---
7	1620	1560	1590	1380	1140	1310	---	---	---	---	---	---
8	1670	1620	1650	1140	1090	1110	---	---	---	760	740	750
9	1700	1660	1680	1120	1070	1100	600	---	---	---	---	---
10	1730	---	1710	1070	890	980	610	---	---	800	760	780
11	1760	1720	1740	910	820	860	---	---	---	800	770	790
12	1830	1760	1800	830	770	790	610	600	600	---	---	---
13	1870	1830	1850	770	730	750	620	600	610	---	---	---
14	1880	1790	1860	740	700	720	650	620	630	---	---	---
15	1910	1870	1890	700	670	690	---	---	---	830	780	800
16	1930	1900	1920	---	---	---	---	---	---	880	740	820
17	1960	1930	1950	670	650	660	700	660	680	860	780	830
18	1980	1950	1960	660	650	650	---	---	---	870	760	840
19	2000	1970	1980	660	650	650	730	700	710	840	820	830
20	2020	1990	2000	660	650	660	730	710	720	---	---	---
21	2020	2000	2010	670	660	660	730	710	720	840	820	830
22	2040	2010	2020	670	650	660	---	---	---	850	830	840
23	2060	2010	2040	660	650	650	---	---	---	---	800	850
24	---	2040	2070	650	590	620	---	---	---	830	790	810
25	2130	2070	2100	610	560	590	---	---	---	840	770	820
26	2170	2130	2140	580	560	570	750	730	740	860	780	840
27	2150	2130	2140	570	540	560	760	730	740	850	820	830
28	2130	2070	2110	550	510	530	760	740	740	920	840	870
29	2110	2040	2090	530	510	520	750	---	---	940	820	900
30	---	---	---	---	---	---	---	---	---	890	840	860
31	---	---	---	---	---	---	---	---	---	880	830	860
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	880	800	860									
2	---	---	---									
3	980	910	940									
4	1020	960	---									
5	1040	1010	1020									
6	1050	1020	1030									
7	1060	1030	1040									
8	1060	1030	1050									
9	1040	980	1010									
10	1000	950	980									
11	960	920	940									
12	1000	920	940									
13	990	970	980									
14	980	950	960									
15	960	940	950									
16	960	920	940									
17	980	950	960									
18	980	950	960									
19	970	950	960									
20	960	930	950									
21	940	910	930									
22	940	910	930									
23	---	---	---									
24	910	870	890									
25	950	890	920									
26	970	940	950									
27	950	930	940									
28	950	940	940									
29	970	880	920									
30	910	880	890									
31	---	---	---									
MONTH	---	---	---									

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PH (STANDARD UNITS), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	9.2	8.8	9.1	9.0	9.0	9.0	8.7	8.6	8.4	8.4	8.2	8.1
2	9.1	9.0	9.0	8.6	9.0	8.9	8.7	8.7	---	---	8.2	8.1
3	9.2	9.1	9.0	8.9	9.0	8.9	8.7	8.7	8.4	8.4	8.2	8.1
4	9.2	9.1	9.0	8.9	9.0	8.9	8.7	8.6	8.4	8.3	8.2	8.1
5	9.2	9.1	9.0	8.9	9.0	8.9	8.7	8.6	8.3	8.3	8.3	8.2
6	9.0	8.9	9.0	8.9	9.0	9.0	8.7	8.6	8.3	8.3	8.3	8.2
7	9.1	8.9	9.0	8.9	9.0	8.9	8.7	8.6	8.3	8.3	8.3	8.2
8	9.1	9.0	9.0	8.9	9.0	8.9	8.6	8.6	8.3	8.3	8.3	8.2
9	9.0	8.8	9.0	8.7	9.0	9.0	8.6	8.6	8.3	8.3	8.4	8.2
10	9.0	8.9	9.0	9.0	9.0	9.0	8.6	8.6	8.3	8.2	8.4	8.4
11	9.0	8.9	9.1	9.0	9.0	9.0	8.7	8.6	8.3	8.2	8.5	8.4
12	9.0	8.9	9.1	9.0	9.0	8.9	8.7	8.6	8.3	8.2	8.5	8.3
13	9.1	8.9	9.1	9.0	8.9	8.9	8.6	8.6	8.3	8.2	8.6	8.4
14	9.1	9.0	9.1	9.0	9.0	8.9	8.6	8.6	8.3	8.2	8.6	8.5
15	9.0	9.0	9.0	9.0	9.0	8.9	8.6	8.6	8.3	8.2	8.7	8.5
16	9.0	9.0	9.0	8.9	9.0	8.9	8.6	8.6	8.3	8.2	---	---
17	9.1	8.9	9.0	8.8	9.0	9.0	8.6	8.6	8.3	8.2	8.8	---
18	9.1	9.0	9.1	8.9	9.0	9.0	8.6	8.6	8.3	8.3	8.8	8.8
19	9.1	9.0	9.1	9.0	9.0	8.9	8.6	8.5	8.3	8.3	8.9	8.8
20	---	---	9.1	9.0	9.0	8.9	8.6	8.5	8.3	8.3	8.9	8.8
21	9.0	8.5	9.1	9.1	8.9	8.9	8.6	8.5	8.3	8.2	8.9	8.8
22	9.0	8.5	9.1	9.1	8.9	8.9	8.5	8.5	8.3	8.2	8.9	8.8
23	9.0	8.8	9.1	9.1	8.9	8.8	8.5	8.5	8.3	8.2	8.8	8.8
24	9.0	8.9	9.1	9.0	8.8	8.8	8.5	8.5	8.3	---	8.8	8.8
25	9.0	8.8	9.1	9.0	8.8	8.8	8.5	8.5	8.3	8.2	8.8	8.7
26	9.0	8.7	9.0	9.0	8.8	8.7	8.5	8.5	---	---	8.8	8.7
27	9.0	8.9	9.0	9.0	8.8	8.7	8.5	8.4	---	---	8.8	8.7
28	9.0	8.9	9.0	9.0	8.8	8.7	8.5	8.5	8.2	8.2	8.8	8.8
29	9.1	8.9	9.0	8.9	---	8.7	8.5	8.5	8.2	8.2	8.9	8.8
30	9.1	9.0	9.0	8.9	8.7	8.7	8.5	8.4	---	---	---	---
31	9.1	9.0	---	---	8.7	8.6	8.5	8.4	---	---	---	---
MONTH	---	---	9.1	8.6	---	8.6	8.7	8.4	---	---	---	---

PH (STANDARD UNITS), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	8.8	8.4	8.8	8.4	---	---	---	---	---	---
2	---	---	8.7	8.3	---	---	---	---	---	---	---	---
3	---	---	8.8	8.6	8.9	8.4	---	---	---	---	---	---
4	---	---	---	---	8.8	8.6	---	---	---	---	---	---
5	---	---	8.9	8.7	8.6	8.4	---	---	---	---	---	---
6	---	---	---	---	8.7	8.3	---	---	---	---	---	---
7	---	---	---	---	8.9	8.4	---	---	---	---	---	---
8	---	---	9.0	8.7	9.0	8.6	---	---	---	---	---	---
9	8.9	---	---	---	8.9	8.7	---	---	---	---	---	---
10	8.9	---	9.0	8.7	8.9	8.6	---	---	---	---	---	---
11	---	---	9.1	8.7	8.9	8.7	---	---	---	---	---	---
12	9.0	8.9	---	---	---	8.6	---	---	---	---	---	---
13	9.0	8.9	---	---	8.8	8.6	---	---	---	---	---	---
14	8.9	8.8	---	---	9.0	8.6	---	---	---	---	---	---
15	---	---	8.9	8.7	8.9	8.6	---	---	---	---	---	---
16	---	---	9.0	8.7	8.8	8.7	---	---	---	---	---	---
17	9.0	---	9.0	8.7	8.9	8.7	---	---	---	---	---	---
18	---	8.7	8.9	8.8	8.8	8.6	---	---	---	---	---	---
19	---	8.7	8.8	8.5	8.9	8.6	---	---	---	---	---	---
20	8.9	8.7	---	---	8.8	8.7	---	---	---	---	---	---
21	8.9	8.8	8.9	8.8	8.7	8.6	---	---	---	---	---	---
22	---	---	8.9	8.8	8.7	8.6	---	---	---	---	---	---
23	---	---	9.1	---	---	---	---	---	---	---	---	---
24	---	---	9.0	8.8	8.6	8.4	---	---	---	---	---	---
25	---	---	8.9	8.8	8.7	8.5	---	---	---	---	---	---
26	8.9	8.8	8.9	8.6	8.7	8.6	---	---	---	---	---	---
27	8.9	8.7	8.9	8.6	8.7	8.6	---	---	---	---	---	---
28	8.9	8.7	8.9	8.7	8.7	8.5	---	---	---	---	---	---
29	---	---	8.8	8.4	8.4	8.4	---	---	---	---	---	---
30	---	---	8.7	8.4	8.6	8.2	---	---	---	---	---	---
31	---	---	8.8	8.5	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	14.0	12.0	13.1	11.6	10.7	11.1	---	---	---
2	---	---	---	12.1	10.2	10.8	11.6	10.9	11.2	---	---	---
3	---	---	---	10.3	9.1	9.7	11.1	10.5	10.7	---	---	---
4	---	---	---	9.9	8.8	9.4	11.2	10.5	10.8	---	---	---
5	---	---	---	10.7	8.9	9.7	11.6	10.3	10.9	---	---	---
6	12.1	11.0	11.6	11.4	9.8	10.6	11.7	10.9	11.3	---	---	---
7	13.3	10.5	11.8	12.2	10.4	11.2	11.3	10.5	10.9	---	---	---
8	13.1	11.6	12.2	12.0	10.0	11.1	11.0	10.3	10.6	---	---	---
9	13.9	11.4	12.6	12.7	10.7	11.7	11.0	10.1	10.5	---	---	---
10	15.0	12.3	13.6	13.2	11.7	12.3	10.7	9.5	10.0	---	---	---
11	15.0	13.3	14.2	13.0	11.4	12.2	9.4	8.5	9.4	>20.0	---	---
12	16.8	13.9	15.3	13.0	11.4	12.2	8.3	7.8	8.3	>20.0	18.9	>20.0
13	16.6	13.4	14.7	13.1	11.3	12.2	8.5	7.6	8.0	>20.0	>20.0	>20.0
14	16.2	12.6	14.3	12.5	10.4	11.3	8.5	7.6	8.1	>20.0	>20.0	>20.0
15	15.7	14.4	14.9	10.7	9.1	9.8	8.9	8.1	8.6	>20.0	>20.0	>20.0
16	14.6	12.7	13.5	15.0	9.0	10.2	9.5	8.4	8.8	>20.0	>20.0	>20.0
17	14.5	11.9	12.9	10.8	9.0	9.9	10.1	8.9	9.5	>20.0	>20.0	>20.0
18	14.0	11.3	12.6	12.3	10.0	11.1	10.4	9.5	9.8	>20.0	>20.0	>20.0
19	14.7	12.3	13.4	13.3	11.5	12.3	10.3	9.4	9.9	>20.0	>20.0	>20.0
20	---	---	---	14.6	12.3	13.5	10.4	9.5	10.0	>20.0	>20.0	>20.0
21	14.2	12.4	13.4	14.8	13.2	14.0	10.4	9.4	9.9	>20.0	>20.0	>20.0
22	14.1	12.6	13.4	14.7	13.5	14.1	10.2	8.8	9.6	>20.0	>20.0	>20.0
23	14.2	12.7	13.4	14.9	13.5	14.2	10.2	9.2	9.7	>20.0	>20.0	>20.0
24	14.3	12.2	13.1	14.9	14.0	14.4	10.1	9.2	9.7	>20.0	>20.0	>20.0
25	13.8	12.0	12.9	14.6	13.4	14.1	10.1	8.7	9.7	>20.0	>20.0	>20.0
26	13.4	10.7	11.4	14.1	12.9	13.4	10.1	9.0	9.4	>20.0	>20.0	>20.0
27	12.6	10.3	11.4	13.9	12.5	13.2	10.0	9.1	9.6	>20.0	>20.0	>20.0
28	13.6	11.2	12.4	13.3	12.2	12.9	9.7	8.8	9.2	>20.0	>20.0	>20.0
29	14.8	12.5	13.5	12.4	11.2	11.6	9.6	8.6	9.2	>20.0	>20.0	>20.0
30	14.9	13.3	14.1	11.5	10.7	11.0	8.9	7.9	8.4	>20.0	>20.0	>20.0
31	15.1	13.3	14.0	---	---	---	8.6	7.8	8.2	>20.0	>20.0	>20.0
MONTH	---	---	---	15.0	8.8	11.9	11.7	7.6	9.7	---	---	---

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	10.0	7.0	9.2
2	---	---	---	>20.0	>20.0	>20.0	---	---	---	10.9	8.5	9.6
3	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	11.1	9.5	10.3
4	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
5	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	13.2	10.6	11.7
6	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
7	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	---	---
8	>20.0	>20.0	>20.0	>20.0	>20.0	---	---	---	---	12.7	9.4	10.6
9	>20.0	>20.0	>20.0	>20.0	>20.0	---	11.2	11.1	11.1	---	---	---
10	>20.0	>20.0	>20.0	>20.0	>20.0	>20.0	10.7	10.6	10.6	12.7	9.2	11.0
11	---	---	---	>20.0	18.1	>20.0	---	---	---	12.6	10.1	11.3
12	---	---	---	>20.0	18.0	19.9	11.4	10.4	10.8	---	---	---
13	---	---	---	>20.0	20.0	>20.0	11.2	10.0	10.5	---	---	---
14	---	---	---	>20.0	>20.0	>20.0	12.1	9.6	10.8	---	---	---
15	---	---	---	>20.0	>20.0	>20.0	---	---	---	11.1	8.3	10.0
16	---	---	---	---	---	---	---	---	---	14.3	9.3	11.3
17	---	---	---	>20.0	>20.0	>20.0	11.7	10.4	11.1	12.8	9.7	11.0
18	---	---	---	>20.0	>20.0	>20.0	---	---	---	10.6	8.0	9.5
19	---	---	---	>20.0	20.0	>20.0	---	---	---	11.4	6.7	8.4
20	---	---	---	>20.0	19.9	>20.0	13.4	11.2	12.3	---	---	---
21	---	---	---	>20.0	19.2	19.9	13.4	11.9	12.5	11.3	9.5	10.4
22	---	---	---	20.0	18.4	19.3	---	---	---	10.9	8.8	11.3
23	---	---	---	19.6	18.7	19.0	---	---	---	15.3	6.6	13.2
24	>20.0	---	---	18.8	16.3	17.5	---	---	---	12.8	8.6	11.2
25	>20.0	>20.0	>20.0	17.5	14.6	15.7	---	---	---	9.4	6.3	8.2
26	---	---	---	16.0	14.5	15.2	12.7	11.0	11.8	9.8	3.7	6.6
27	---	---	---	16.1	14.9	15.4	12.8	11.4	12.2	9.5	4.3	7.1
28	>20.0	>20.0	>20.0	15.3	13.3	14.2	12.5	10.4	11.6	8.2	4.3	7.2
29	>20.0	>20.0	>20.0	14.4	12.8	13.6	---	---	---	7.0	1.4	5.2
30	---	---	---	---	---	---	---	---	---	6.8	1.5	4.6
31	---	---	---	---	---	---	---	---	---	7.9	5.3	6.4
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

> Actual value is known to be greater than the value shown

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.8	3.0	5.2	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	5.8	2.5	4.3	---	---	---	---	---	---	---	---	---
4	4.6	.8	2.7	---	---	---	---	---	---	---	---	---
5	3.4	.5	1.7	---	---	---	---	---	---	---	---	---
6	7.6	1.7	4.5	---	---	---	---	---	---	---	---	---
7	9.4	1.6	5.1	---	---	---	---	---	---	---	---	---
8	6.7	1.1	4.2	---	---	---	---	---	---	---	---	---
9	5.2	1.0	2.5	---	---	---	---	---	---	---	---	---
10	8.1	2.0	5.4	---	---	---	---	---	---	---	---	---
11	8.3	4.9	6.6	---	---	---	---	---	---	---	---	---
12	8.0	3.3	5.7	---	---	---	---	---	---	---	---	---
13	7.6	4.0	5.4	---	---	---	---	---	---	---	---	---
14	9.0	4.0	6.8	---	---	---	---	---	---	---	---	---
15	8.9	4.5	6.5	---	---	---	---	---	---	---	---	---
16	11.4	5.7	7.0	---	---	---	---	---	---	---	---	---
17	12.6	7.1	9.2	---	---	---	---	---	---	---	---	---
18	8.9	4.1	6.0	---	---	---	---	---	---	---	---	---
19	9.5	4.9	7.3	---	---	---	---	---	---	---	---	---
20	8.2	5.1	6.8	---	---	---	---	---	---	---	---	---
21	7.6	3.6	4.7	---	---	---	---	---	---	---	---	---
22	9.0	5.9	7.6	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	9.0	3.7	5.9	---	---	---	---	---	---	---	---	---
25	9.9	5.0	7.7	---	---	---	---	---	---	---	---	---
26	11.8	4.2	7.4	---	---	---	---	---	---	---	---	---
27	9.4	5.4	7.5	---	---	---	---	---	---	---	---	---
28	7.1	4.4	5.7	---	---	---	---	---	---	---	---	---
29	9.7	5.3	8.3	---	---	---	---	---	---	---	---	---
30	11.1	5.7	8.4	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

06470878 JAMES RIVER AT ND-SD STATE LINE

LOCATION.--Lat 45°56'10", long 98°10'26", in SE¼SE¼ 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, 87.10 ft, Aug. 23, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum observed, 89.59 ft, May 1; minimum observed, 87.10 ft, Aug. 23, falling stage, was lower during period of missing record, Aug. 24 to Sept. 30.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88.70	89.08	---	---	---	---	---	89.29	88.68	87.80	---	---
2	88.72	89.09	---	---	---	---	---	88.94	88.54	87.83	---	---
3	88.68	89.13	---	---	---	---	---	88.52	88.50	87.78	---	---
4	88.68	89.15	---	---	---	---	---	88.56	88.53	87.80	---	---
5	88.90	89.14	---	---	---	---	---	88.66	88.61	87.97	---	---
6	88.82	89.10	---	---	---	---	---	89.00	88.60	88.12	---	---
7	88.79	89.08	---	---	---	---	---	88.83	88.48	87.80	---	---
8	88.81	89.13	---	---	---	---	---	88.56	88.33	---	---	---
9	88.92	89.03	---	---	---	---	---	88.50	88.36	---	---	---
10	88.81	89.10	---	---	---	---	---	88.55	88.42	---	---	---
11	88.85	89.03	---	---	---	---	---	88.60	88.49	---	---	---
12	88.90	89.07	---	---	---	---	---	88.53	88.16	---	---	---
13	88.96	89.10	---	---	---	---	---	88.58	88.11	---	---	---
14	88.98	89.08	---	---	---	---	---	88.64	88.18	---	---	---
15	88.98	89.09	---	---	---	---	---	88.48	88.22	---	---	---
16	89.02	89.20	---	---	---	---	---	88.49	88.21	---	---	---
17	89.02	89.15	---	---	---	---	---	88.73	88.22	---	---	---
18	89.03	89.07	---	---	---	---	---	88.88	88.27	---	---	---
19	89.06	88.91	---	---	---	---	89.04	88.44	88.12	---	---	---
20	89.08	88.87	---	---	---	---	89.06	88.40	88.14	---	---	---
21	89.08	88.78	---	---	---	---	88.98	88.46	88.14	---	---	---
22	89.06	88.63	---	---	---	---	88.96	88.48	87.97	---	---	---
23	89.06	---	---	---	---	---	88.89	88.60	88.09	---	---	---
24	89.09	---	---	---	---	---	88.92	88.70	87.97	---	---	---
25	89.13	---	---	---	---	---	88.78	88.94	87.84	---	---	---
26	89.12	---	---	---	---	---	88.75	88.70	87.89	---	---	---
27	89.17	---	---	---	---	---	88.73	88.60	88.02	---	---	---
28	89.10	---	---	---	---	---	88.77	88.66	87.91	---	---	---
29	89.09	---	---	---	---	---	88.86	88.86	87.76	---	---	---
30	89.10	---	---	---	---	---	88.98	88.91	87.83	---	---	---
31	89.08	---	---	---	---	---	---	88.90	---	---	---	---
MEAN	88.96	---	---	---	---	---	---	88.68	88.22	---	---	---
MAX	89.17	---	---	---	---	---	---	89.29	88.68	---	---	---
MIN	88.68	---	---	---	---	---	---	88.40	87.76	---	---	---

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, SD, 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 mi^2 approximately, of which about 3,300 mi^2 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, ND 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, 89.16, May 1; minimum, 86.15 ft, Sept. 18.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88.62	88.79	87.92	87.67	87.64	87.60	88.54	88.91	88.51	87.66	87.01	86.62
2	88.55	88.81	87.88	87.67	87.65	87.62	88.58	88.73	88.42	87.68	87.09	86.62
3	88.48	88.85	87.85	87.66	87.66	87.63	88.62	88.47	88.39	87.68	87.13	86.45
4	88.51	88.90	87.82	87.66	87.64	87.65	88.65	88.49	88.39	87.64	87.13	86.30
5	88.75	88.86	87.78	87.64	87.62	87.66	88.68	88.55	88.42	87.66	87.22	86.28
6	88.60	88.84	87.74	87.64	87.62	87.68	88.71	88.66	88.41	87.74	87.22	86.40
7	88.54	88.83	87.72	87.63	87.60	87.69	88.72	88.68	88.32	87.69	87.26	86.60
8	88.60	88.88	87.69	87.62	87.59	87.71	88.74	88.53	88.22	87.50	87.04	86.63
9	88.69	88.78	87.66	87.61	87.58	87.73	88.75	88.53	88.21	87.48	87.08	86.47
10	88.58	88.81	87.66	87.61	87.57	87.75	88.76	88.48	88.23	87.43	87.20	86.35
11	88.59	88.78	87.71	87.60	87.56	87.78	88.77	88.51	88.25	87.39	87.09	86.46
12	88.62	88.81	87.64	87.61	87.55	87.80	88.78	88.48	88.10	87.40	87.03	86.35
13	88.68	88.82	87.71	87.59	87.55	87.83	88.79	88.56	88.03	87.58	87.01	86.30
14	88.69	88.81	87.70	87.59	87.54	87.86	88.80	88.57	88.10	87.50	86.99	86.31
15	88.70	88.83	87.70	87.58	87.54	87.89	88.81	88.37	88.12	87.48	87.01	86.34
16	88.75	88.94	87.71	87.59	87.54	87.92	88.81	88.44	88.08	87.40	87.10	86.42
17	88.76	88.89	87.71	87.59	87.53	87.97	88.83	88.63	88.08	87.40	86.94	86.41
18	88.78	88.81	87.71	87.59	87.53	88.01	88.84	88.46	88.09	87.37	86.80	86.28
19	88.80	88.71	87.71	87.59	87.52	88.05	88.84	88.35	88.02	87.37	86.88	86.47
20	88.84	88.64	87.71	87.58	87.53	88.10	88.85	88.40	87.98	87.33	86.97	86.43
21	88.80	88.55	87.71	87.57	87.53	88.15	88.85	88.41	87.99	87.31	87.10	86.61
22	88.80	88.43	87.70	87.57	87.54	88.19	88.85	88.55	87.87	87.32	86.96	86.70
23	88.81	88.32	87.70	87.59	87.55	88.23	88.85	88.54	87.88	87.37	86.87	86.79
24	88.82	88.26	87.70	87.60	87.55	88.27	88.84	88.57	87.86	87.34	86.75	86.89
25	88.82	88.20	87.70	87.58	87.55	88.32	88.83	88.71	87.76	87.28	86.68	86.71
26	88.88	88.15	87.69	87.58	87.55	88.35	88.75	88.56	87.76	87.30	86.64	86.69
27	88.89	88.08	87.69	87.58	87.56	88.39	88.66	88.50	87.79	87.29	86.70	86.59
28	88.83	88.01	87.68	87.60	87.57	88.43	88.66	88.51	87.78	87.31	86.63	86.62
29	88.81	87.94	87.68	87.61	87.58	88.47	88.70	88.63	87.63	87.25	86.64	86.57
30	88.81	87.96	87.68	87.62	---	88.50	88.75	88.65	87.66	87.13	86.66	86.83
31	88.80	---	87.68	87.63	---	88.52	---	88.65	---	87.14	86.71	---
MEAN	88.72	88.61	87.72	87.61	87.57	87.99	88.75	88.55	88.08	87.43	86.95	86.52
MAX	88.89	88.94	87.92	87.67	87.66	88.52	88.85	88.91	88.51	87.74	87.26	86.89
MIN	88.48	87.94	87.64	87.57	87.52	87.60	88.54	88.35	87.63	87.13	86.63	86.28

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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 (FTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
06...	1000	193	600	8.72	3.0	8.0	17	10.0	83	--	220
NOV											
16...	1700	301	650	8.95	1.0	3.0	3.9	15.5	114	--	240
FEB											
24...	1200	19	1800	8.25	-15.0	0.5	3.1	20.0	136	--	620
APR											
11...	1330	50	570	8.91	18.0	9.0	14	12.7	108	5.9	210
MAY											
23...	1300	11	800	8.48	25.0	17.5	19	10.5	107	4.4	290

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											
06...	49	24	40	27	1	15	217	95	11	379	364
NOV											
16...	52	26	49	30	1	13	225	100	16	404	391
FEB											
24...	100	89	190	39	3	24	501	450	91	1260	1240
APR											
11...	47	23	44	30	1	9.8	180	120	17	372	369
MAY											
23...	61	33	63	31	2	17	246	160	22	532	504

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, 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										
06...	0.52	197	36	--	<0.010	--	<0.100	--	<0.010	--
NOV										
16...	0.55	328	12	--	<0.010	--	<0.100	--	0.010	--
FEB										
24...	1.71	64.6	13	--	<0.010	--	<0.100	--	0.020	--
APR										
11...	0.51	50.2	40	<0.010	<0.010	<0.100	<0.100	0.020	0.020	1.1
MAY										
23...	0.72	15.8	26	0.010	<0.010	<0.100	<0.100	0.030	<0.010	1.0

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHOROUS 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										
06...	0.40	--	0.030	--	0.007	--	3	100	--	<1
NOV										
16...	0.80	--	0.010	--	<0.001	--	2	120	--	<1
FEB										
24...	1.0	--	0.030	--	<0.002	--	1	470	--	<1
APR										
11...	0.60	0.140	0.030	0.028	0.008	1	2	100	1	<1
MAY										
23...	0.70	0.140	0.030	0.045	0.008	2	2	160	1	<1

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 06...	1	--	6	<5	--	9	0.2	--	<1	<3
NOV 16...	<1	--	5	<5	--	6	0.1	--	<1	<3
FEB 24...	1	--	7	<5	--	18	<0.1	--	<1	14
APR 11...	1	260	10	<5	230	60	0.2	<1	<1	<3
MAY 23...	1	950	6	<5	630	130	0.2	<1	<1	<3

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 06...	--	--	<0.01	--	--	--	--	35	18	99
NOV 16...	--	--	--	--	--	--	--	17	14	91
FEB 24...	--	--	<0.01	--	--	--	--	48	2.5	33
APR 11...	10	<0.010	<0.01	10.0	0.600	18	1200	29	3.9	90
MAY 23...	15	<0.010	<0.01	42.0	5.20	23	1200	37	1.1	97

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 mi^2, of which about 332 mi^2 is probably noncontributing.

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.--Estimated daily discharges: Mar. 1-4. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--32 years, 20.3 ft^3/s, 14,710 acre-ft/yr; median of yearly mean discharges, 12 ft^3/s, 8,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft^3/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 year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
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	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CAL YR 1987 TOTAL 16883.04 MEAN 46.3 MAX 1600 MIN .00 AC-FT 33490
WTR YR 1988 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .0

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites 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	ANNUAL MAXIMUM Gage height (ft)	ANNUAL MAXIMUM Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN					
05052100	Richland County Drain #65 nr Great Bend, ND	Lat 46°05'41", long 96°47'01", in NE¼ NE¼ NE¼ sec.11, T.130 N., R.49 W., Richland County, Hydrologic Unit 09020105, at bridge on county road 4 mi south and 1 mi east of Great Bend.	38	#1981-85, 1986-88	2-28-88	[b]2.89	[a]1.0
05056244	St. Joe Coulee nr Webster, ND	Lat 48°19'23", long 99°00'19", in NE¼ NE¼ sec.21, T.156 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on bridge crossing 2.75 mi north and 6 mi west of Webster.	---	1986-88	3-31-88	44.86	5.0
05060510	Cass County Drain #52 nr Amenia, ND	Lat 46°58'41", long 97°11'52", in SE¼ SE¼ SE¼ sec.36, T.141 N., R.52 W., Cass County, Hydrologic Unit 09020204, on left bank 40 ft upstream on county road, 0.7 mi south, and 1 mi east of Amenia.	13.5	#1981-85, 1986-88	3-11-88	[b]5.48	[a]10
050605550	Rush River nr Prosper, ND	Lat 46°57'59", long 97°03'04", in NE¼ SE¼ SE¼ sec.1, T.140 N., R.51 W., Cass County, Hydrologic Unit 09020204, on right bank 30 ft upstream on county road, 1.5 mi west, and 0.2 mi north of Prosper.	170	#1981-85, 1986-88	3-28-88	[b]7.74	[a]90
05060570	Lower Branch Rush River nr Prosper, ND.	Lat 46°56'30", long 96°59'18", in NE¼ NE¼ SE¼ sec.16, T.140 N., R.50 W., Cass County, Hydrologic Unit 09202004, on right bank 60 ft upstream on county road, 1.5 mi east, and 1.5 mi south of Prosper.	35.8	#1981-85, 1986-88	3-29-88 4-03-88	[b]6.38 3.94	ice jam 44
05062200	Elm River n Kelso, ND	Lat 47°17'30", long 97°06'50", in sec.23, T.144 N., R.51 W., Traill County, Hydrologic Unit 09020107, on left bank 50 ft upstream from county road, 4.0 mi south, and 3.4 mi west of Kelso.	199	#1955-63, [d]1965-73, #1980-88	3-28-88	[b]9.93	[a]100
05065500	Goose River nr Portland, ND	Lat 47°32'20", long 97°27'20", in SE¼ NE¼ sec.19, T.147 N., R.53 W., Traill County, Hydrologic Unit 09020101, on left bank 75 ft upstream from bridge on State Highway 18, 1.2 mi upstream from unnamed tributary , 4 mi downstream from Beaver Creek, and 5 mi northwest of Portland.	517	#1939-75, 1980-87	3-29-88	[b]11.20	[a]500

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station Name	Location	Drainage area (mi^2)	Period of record	Date	ANNUAL MAXIMUM Gage height (ft)	ANNUAL MAXIMUM Discharge (ft^3/s)
		RED RIVER OF THE NORTH--CONTINUED					
	Red River at Grand Forks, ND	Lat 47°56'34", long 97°03'10", in SW1/4 NE1/4 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 1987-88	4-05-88	19.68	8,500
05083000	Turtle River at Manvel, ND	Lat 48°04'43", long 97°11'03", in SE1/4 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, 1980-88	4-03-88	b13.88	a600
05083500	Red River of the North at Oslo, MN	Lat 48°11'40", long 97°08'30", in SW1/4SW1/4 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, 1985-88	4-06-88	20.10	a11,500
05102490	Red River of the North at Pembina, ND	Lat 48°58'17", long 97°14'16", in NE1/4 sec.4, T.163 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on bridge crossing the Red River 0.2 mi north of Pembina.	40,200	1985-88	4-08-88	757.35	c15,700
		SOURIS RIVER BASIN					
05119410	Bonnes Coulee at Velva, ND	Lat 48°03'30", long 100°57'00", in NE1/4SW1/4 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, 1987-88	4-07-88	----	a3.0
		KNIFE RIVER BASIN					
06339490	Elm Creek near Golden Valley, ND	Lat 47°06'25", long 102°03'05", in SE1/4 NW1/4 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 1982-88	3-24-88	4.60	43
06340200	West Branch Otter Creek near Beulah, ND	Lat 47°08'05", long 101°39'35", in NW1/4 NW1/4 SW1/4 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, 1984-88	3-22-88	b3.96	14
		HEART RIVER BASIN					
06343000	Heart River near South Heart, ND	Lat 46°51'56", long 102°56'53", in NE1/4 SE1/4 SW1/4 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, 1985-88	3-01-88	b4.23	50
06348300	Heart River at Starck Bridge near Judson, ND	Lat 46°42'11", long 101°12'45", in SE1/4 SW1/4 SW1/4 sec.6, T.137 N., R.83 W., Morton County, Hydrologic Unit 10130203, at Starck bridge, 9.5 mi southeast of Judson.	---	1986-88	3-27-88	26.48	a600

\# - Operated as a continuous-record gaging station
a - Estimate
b - Backwater from ice
c - Discharge determined using record from station 2 mi downstream
d - Annual maximum only

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 1988

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN				
Mauvais Coulee Tributary No. 3 near Cando, ND 05056060	Mauvais Coulee	Lat 48°27'28", long 99°14'06", in NW1/4 NW1/4, sec.6, T.157 N., R.66 W., Towner County, Hydrologic Unit 09020201, at bridge 2.1 mi south of Cando.	60.2	1955-71, 1986-87	10-28-87	0.00
					03-02-88	0.00
					03-10-88	0.01
					03-24-88	0.34
					04-06-88	0.18
					04-21-88	0.02
					06-08-88	0.00
					09-14-88	0.00
Sheyenne River[a]	Red River of the North	Lat 46°22'02", long 97°33'47", in NW1/4 NW1/4 NE1/4 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[b], 1983-87	06-01-88	45.9
					06-28-88	12.9
					07-18-88	9.59
					07-25-88	6.39
					08-17-88	21.6
					09-08-88	5.30
Sheyenne River[a]	Red River of the North	Lat 46°30'54", long 97°29'23", in SE1/4 SE1/4 SE1/4 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.	---	1963b, 1983-87	06-01-88	57.8
					06-28-88	9.58
					07-18-88	13.7
					07-25-88	5.45
					08-18-88	16.1
					09-08-88	7.49
					09-28-88	21.3
Sheyenne River[a]	Red River of the North	Lat 46°31'01", long 97°20'33", in NW1/4 SW1/4 SW1/4 sec.10, T.135 N., R.53 W., Ransom County, Hydrologic Unit 09020204, on bridge 7 mi east and 5 mi south of Sheldon.	---	1983-87	06-02-88	67.4
					06-28-88	11.1
					07-18-88	18.4
					07-25-88	10.6
					08-18-88	6.51
					09-08-88	12.9
					09-28-88	30.0
Maple River[a]	Sheyenne River	Lat 46°44'18", long 97°15'37", in SW1/4 SW1/4 NW1/4 sec.28, T.138 N., R.52 W., Cass County, Hydrologic Unit 09020205, 6 mi north and 1 mi west of Leonard.	---	1984-87	06-02-88	6.62
Pembina River[a]	Red River of the North	Lat 48°56'15", long 97°51'48", in NE1/4 SE1/4 SE1/4 sec.15, T.163 N., R.56 W., Pembina County, Hydrologic Unit 09020313, 1/2 mi north and 1 1/2 mi east of Walhalla.	---	1984-85, 1987	06-03-88	22.7
					06-30-88	4.21
Pembina River[a]	Red River of the North	Lat 49°58'00", long 97°14'29", in lot 5, sec.4, T.163 N., R.51 W., Pembina County, Hydrologic Unit 09020313, 200 ft downstream of bridge in Pembina.	---	---	06-29-88	7.19
					07-26-88	1.28
Souris River[a]	Assiniboine River	Lat 48°03'50", long 100°55'42", in SE1/4 NE1/4 NE1/4 sec.22, T.153 N., R.80 W., McHenry County, Hydrologic Unit 09010003, on bridge on Highway 41 north side of Velva.	---	---	08-26-88	57.3
					08-30-88	73.1
					09-02-88	57.4
					09-06-88	36.4
					09-09-88	30.3
					09-21-88	24.7
					09-26-88	13.3
Souris River[a]	Assiniboine River	Lat 48°16'54", long 100°28'54", in NE1/4 NW1/4 NE1/4 sec.6, T.155 N., R.76 W., McHenry County, Hydrologic Unit 09010003, 4 mi south and 3 1/2 mi west of Towner.	---	---	08-15-88	15.3
					08-19-88	9.14
					08-26-88	6.01
					08-30-88	41.0
					09-01-88	46.8
					09-06-88	48.2
					09-09-88	38.8
					09-13-88	38.1
					09-28-88	31.9
					09-29-88	26.3

a - Current year measurements furnished by and previous measurement data available from North Dakota State Water Commission unless otherwise noted.
b - Data collected by U.S. Geological Survey.

Discharge measurements made at miscellaneous sites during water year 1988--continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		LITTLE MISSOURI RIVER BASIN				
Little Beaver Creek near Marmarth, ND 06335000[a]	Little Missouri River	Lat 46°16'29", long 103°58'33", in NW1/4 SE1/4 NE1/4 sec. 7, T.132 N., R.106 W., Bowman County, Hydrologic Unit 10110201, 50 feet downstream of concrete ford, 3 mi southwest of Marmarth.	587	1938-79#[b], 1986-87	05-03-88 06-02-88	3.67 0.21
Little Missouri[a] River	Missouri River	Lat 46°35'33", long 103°30'53", in SE1/4 SW1/4 NE1/4 sec.17, T.136 N., R.102 W., Slope County, Hydrologic Unit 10110203, ten mi west and 8 mi north of Amidon.	---	1985-87	05-03-88 06-02-88 06-22-88 07-14-88 08-09-88	28.2 24.5 8.52 11.3 0.17
Little Missouri River at Medora, ND 06336000[a]	Missouri River	Lat 46°55'10", long 103°31'40", in NE1/4 NW1/4 NE1/4 sec. 27, T.140 N., R.102 W., Billings County, Hydrologic Unit 10110203, on bridge on county highway in Medora.	6,190	1903-08#[b], 1921-24#[b], 1928-34#[b], 1945-75#[b], 1976[b], 1985-87	04-12-88 05-04-88 06-01-88 06-21-88 07-14-88 08-09-88	81.1 43.7 56.4 26.8 28.2 0.34
Little Missouri[a]	Missouri River	Lat 47°19'57", long 103°39'05", in NE1/4 SE1/4 SE1/4 sec.34, T.145 N., R.102 W., McKenzie County, Hydrologic Unit 10110205, 13 mi. east of Trotters.	---	1985-87	05-04-88 06-01-88 06-21-88 07-14-88 08-09-88	54.1 1.33 62.5 32.4 0.27
		MISSOURI RIVER BASIN				
Missouri River	Missouri River Mainstem	Lat 47°29'42", long 101°25'49", in NE1/4SE1/4NW1/4 sec. 6, T.146 N., R.84 W., McLean County, Hydrologic Unit 10130101, at left bank of Garrison Dam tailrace, 2.5 mi west of Riverdale, and at mile 1,390.	181,400	---	05-03-88	18,300
		KNIFE RIVER BASIN				
Crooked Creek[a]	Knife River	Lat 47°09'52", long 102°41'37", in NW1/4 SW1/4 NW1/4 sec.35, T.143 N., R.95 W., Dunn County, Hydrologic Unit 10130201, 4 mi south and 4 mi east of Manning.	---	---	04-08-88 05-13-88 06-01-88	2.95 2.34 0.25
Knife River[a]	Missouri River	Lat 47°19'50", long 101°27'06", in NE1/4 SE1/4 SW1/4 sec.36, T.145 N., R.85 W., Mercer County, Hydrologic Unit 10130201, 1 mi north and 3 mi west of Stanton.	---	---	09-08-88	10.3
Knife River near Stanton, ND	Missouri River	Lat 47°21"29", long 101°23'49", in SW1/4SW1/4SW1/4 sec.21, T.145 N., R.84 W., Mercer County, Hydrologic Unit 10130201, 100 ft upstream from county bridge, and 2.5 mi north of Stanton.	---	---	05-03-88	82
		MISSOURI RIVER BASIN				
Missouri River near Stanton, ND 06340700	Missouri River Mainstem	Lat 47°17'14", long 101°20'25", in SW1/4 sec.16, T.144 N., R.84 W., McLean County, Hydrologic Unit 10130101, on right bank 3 mi southeast of Stanton, and at mile 1,372.	18,200	---	05-04-89	18,300
Missouri River at Washburn, ND 06341000	Missouri River	Lat 47°17'20", long 101°02'15", in SE1/4SW1/4 sec.14, T.144 N., R82 W., McLean County, Hydrologic Unit 10130101, on alternate Highway 200 bridge at Washburn, and at mile 1,355.	184,000	1987	10-01-87 10-01-87 10-21-87 10-21-87 11-10-87 11-10-87 05-02-88 05-04-88	14,300[c] 14,500 14,000[c] 12,000 12,500[c] 12,600 18,900 18,600
Missouri River	Missouri River Mainstem	Lat 46°58'44", long 100°56'08", in NE1/4SW1/4NW1/4 sec.5, T.140 N., R.81 W., Morton County, Hydrologic Unit 10130101.	---	---	05-05-88	17,900

\# - Operated as a continuous-record gaging station.
a - Current year measurements furnished by and previous measurement data available from North Dakota State Water Commission unless otherwise noted.
b - Data collected by U.S. Geological Survey.
c - Discharge measurement using moving-boat method.

Discharge measurements made at miscellaneous sites during water year 1988--continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		HEART RIVER BASIN				
Green River[a]	Heart River	Lat 46°58'08", long 102°44'54", in NE¼ SE¼ SE¼ sec.2, T.140 N., R.96 W., Stark County, Hydrologic Unit 10130202, 4 mi north and 2 mi east of Dickinson.	---	---	09-27-88	1.44
Green River[a]	Heart River	Lat 46°56'52", long 102°40'53", in NE¼ NW¼ NW¼ sec.16, T.140 N., R.95 W., Stark County, Hydrologic Unit 10130202, 3 mi north and 5 mi east of Dickinson.	---	---	08-02-88 09-14-88	0.84 0.99
Green River near Gladstone, ND 06345000[a]	Heart River	Lat 46°53'31", long 102°37'01", in SE¼ SW¼ SW¼ sec.36, T.140 N., R.95 W., Stark County, Hydrologic Unit 10130202, 7 mi east of Dickinson.	356	1945-76	09-23-88	1.74
Heart River above Lake Tschida nr Glen Ullin, ND[a]	Missouri River	Lat 46°39'28", long 102°09'46", in SW¼ NE¼ NE¼ sec.30, T.137 N., R.90 W., Grant County, Hydrologic Unit 10130202, 16 mi south and 1 mi west of Hebron.	---	1987[b]	04-07-88 04-25-88 05-27-88 06-08-88	53.4 37.9 13.6 3.49
Missouri River	Missouri River Mainstem	Lat 46°42'10", long 100°47'41", in SE¼NE¼NE¼ sec.8, T.137 N., R.80 W., Morton County, Hydrologic Unit 10130102.	---	---	05-06-88	19,000
		APPLE CREEK BASIN				
Long Creek above Long Lake near Moffit, ND 06349215	Apple Creek	Lat 46°37'59", long 100°14'29", in NE¼NE¼NW¼ sec.4, T.136 N., R.76 W., Emmons County, Hydrologic Unit 10130103, and 4 mi southeast of Moffit.	---	---	04-06-88 07-21-88	14.1 0.26
		CANNONBALL RIVER BASIN				
Cannonball River[a]	Missouri River	Lat 46°21'52", long 102°21'04", in SE¼ SE¼ NW¼ sec.3, T.133 N., R.93 W., Hettinger County, Hydrologic Unit 10130204, ½ mi south and 1 mi west of Mott.	---	---	06-22-88	3.71
Cannonball River below Bentley, ND 06351000[a]	Missouri River	Lat 46°21'30", long 102°02'30", in SW¼ SW¼ sec.6, T.133 N., R.90 W., Grant County, Hydrologic Unit 10130204, 2 mi northeast of Bentley.	1,140	1943-81	05-09-88 05-31-88 06-29-88 07-20-88	45.5 10.2 3.56 3.47
Cannonball River[a]	Missouri River	Lat 46°07'35", long 101°19'57", in SW¼ SW¼ NW¼ sec.33, T.131 N., R.85 W., Grant County, Hydrologic Unit 10130204, 16 mi south of Raleigh.	---	---	05-09-88 05-31-88 06-29-88	54.1 13.4 0.59
Cedar River near Pretty Rock, ND 06352500[a]	Cannonball River	Lat 46°01'55", long 101°49'55", in SW¼ SW¼ SW¼ sec.33, T.130 N., R.89 W., Grant County, Hydrologic Unit 10130205, 7 mi north of Keldron, SD.	1,340	1943-76#[b]	04-07-88 05-11-88 05-31-88	37.5 33.5 5.76
		GRAND RIVER BASIN				
North Fork Grand River at Bowman-Haley tailwater	Grand River	Lat 46°59'05", long 103°14'39", in NW¼SW¼NW¼ sec.19, T.129 N., R.100 W., Bowman County, Hydrologic Unit 10130301, 1/8 mi below Bowman-Haley Dam.	---	---	07-25-88	2.85

\# - Operated as a continuous-record gaging station.
a - Current year measurements furnished by and previous measurement data available from North Dakota State Water Commission unless otherwise noted.
b - Data collected by U.S. Geological Survey.

Discharge measurements made at miscellaneous sites during water year 1988--continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		JAMES RIVER BASIN				
James River[a]	Missouri River	Lat 46°40'28", long 98°35'15", in SE¼ SE¼ SE¼ sec.23, T.137 N., R.63 W., Stutsman County, Hydrologic Unit 10160003, on bridge 1 mi south of Montpelier.	---	---	05-31-88	7.74
					06-07-88	32.3
					06-09-88	34.9
					06-13-88	50.6
					06-16-88	22.9
					06-23-88	10.1
					06-27-88	10.7
					06-30-88	32.7
					07-06-88	25.7
					07-12-88	22.0
					08-17-88	20.2
					09-08-88	7.14
					09-27-88	5.96
James River[a]	Missouri River	Lat 46°32'38", long 98°28'26", in NE¼ NE¼ NE¼ sec.4, T.135 N., R.62 W., LaMoure County, Hydrologic Unit 10160003, on bridge ½ mi northwest of Dickey.	---	---	05-24-88	15.1
					05-31-88	12.2
					06-07-88	15.3
					06-09-88	39.0
					06-13-88	73.2
					06-16-88	30.9
					06-23-88	10.7
					06-27-88	16.2
					06-30-88	15.4
					07-06-88	27.6
					07-12-88	23.4
					08-17-88	25.0
					09-08-88	9.86
					09-27-88	7.65
James River[a]	Missouri River	Lat 46°27'13", long 98°22'06", in SW¼ NW¼ NW¼ sec.4, T.134 N., R.61 W., LaMoure County, Hydrologic Unit 10160003, on bridge 1 mi north of Grand Rapids.	---	---	06-09-88	33.0
					06-13-88	37.1
					06-23-88	13.2
					06-27-88	20.7
					07-07-88	29.5
					07-12-88	22.0
					07-28-88	17.4
					08-17-88	28.9
					09-08-88	14.7
					09-27-88	9.82
Maple River[a]	Elm River	Lat 46°15'24", long 98°34'25", in NW¼ NW¼ NE¼ sec.16, T.132 N., R.63 W., Dickey County, Hydrologic Unit 10160004, 6 mi north and ½ mi east of Monango.	---	1984-87	04-05-88	0.83
Maple River[a]	Elm River	Lat 46°13'39", long 98°33'40", in NE¼ NW¼ NW¼ sec.27, T.132 N., R.63 W., Dickey County, Hydrologic Unit 10160004, 4 mi north and 1 mi east of Monango.	---	1984-87	04-05-88	1.19
Maple River[a]	Elm River	Lat 46°08'22", long 98°23'41", in SE¼ SW¼ SW¼ sec.24, T.131 N., R.62 W., Dickey County, Hydrologic Unit 10160004, 1½ mi south and 1½ mi east of Fullerton.	---	1984-87	04-05-88	1.30

a - 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 sediment data are collected systematically over a period of years for use in hydrologic analyses. These data are collected usually less than quarterly. Samples collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin are referred to as miscellaneous sites.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (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)
RED RIVER OF THE NORTH BASIN											
05056060 MAUVIAS COULEE TRIB NO. 3 NEAR CANDO (LAT 48 27 28N LONG 099 14 06W)											
MAR 24..	1040	0.34	810	--	1.5	0.5	--	--	--	--	--
APR 06..	1310	0.18	560	7.51	16.5	3.0	290	71	27	26	15
21..	1420	0.02	905	--	4.0	9.5	--	--	--	--	--
05056244 ST. JOE COULEE NEAR WEBSTER, ND (LAT 48 19 23N LONG 099 00 19W)											
APR 05..	1655	1.9	775	8.70	15.0	8.5	350	92	29	28	14
05060510 CASS COUNTY DRAIN NO. 52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)											
MAR 30..	1635	0.70	197	8.10	6.0	1.0	79	20	7.0	5.5	13
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)											
APR 05..	1810	44	679	8.10	17.0	3.0	280	66	27	33	20
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)											
APR 05..	1550	6.3	252	7.90	18.0	11.0	110	29	8.5	3.5	6
05062200 ELM RIVER NEAR KELSO, ND (LAT 47 17 30N LONG 097 06 50W)											
MAR 31..	1235	64	845	7.90	2.0	1.0	340	77	35	43	21
05065500 GOOSE RIVER NEAR PORTLAND, ND (LAT 47 32 20N LONG 097 27 20W)											
APR 04..	1335	344	875	7.90	4.5	1.5	330	75	34	55	26
05083000 TURTLE RIVER AT MANVEL, ND (LAT 48 04 43N LONG 097 11 03W)											
APR 04..	1200	398	870	7.20	6.0	3.0	420	100	42	210	51
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR 07..	1610	11300	470	7.30	22.0	8.0	200	48	20	17	15
SOURIS RIVER BASIN											
05119410 BONNES COULEE NEAR VELVA, ND (LAT 48 03 30N LONG 100 57 00W)											
MAY 02..	1310	2.0	2510	8.20	9.5	11.5	680	140	81	340	51
KNIFE RIVER BASIN											
06339490 ELM CREEK NEAR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 07..	1420	3.0	1540	7.96	2.0	1.0	210	36	28	250	70
06340200 WEST BRANCH OTTER CREEK NEAR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR 29..	1351	4.3	1520	7.92	6.0	2.0	320	54	45	220	59
HEART RIVER BASIN											
06343000 HEART RIVER NEAR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 03..	1430	26	2250	7.90	9.0	0.5	390	71	51	380	67
06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND (LAT 46 42 11N LONG 101 12 37W)											
APR 11..	1500	62	1280	8.40	21.0	12.5	310	60	39	190	56
MAY 24..	0845	69	1350	--	22.0	17.5	--	--	--	--	--

DATE	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)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
RED RIVER OF THE NORTH BASIN											
05056060 MAUVIAS COULEE TRIB NO. 3 NEAR CANDO (LAT 48 27 28N LONG 099 14 06W)											
APR 06..	0.7	17	160	170	25	0.10	18	424	450	0.21	0.58
05056244 ST. JOE COULEE NEAR WEBSTER, ND (LAT 48 19 23N LONG 099 00 19W)											
APR 05..	0.7	19	190	210	15	0.10	34	526	539	2.76	0.72
05060510 CASS COUNTY DRAIN NO. 52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)											
MAR 30..	0.3	3.7	90	24	1.7	0.10	10	139	127	0.26	0.19
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)											
APR 05..	0.9	8.2	190	170	19	0.20	13	473	449	56.1	0.64
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)											
APR 05..	0.2	5.4	120	25	3.2	0.10	13	171	160	2.93	0.23
05062200 ELM RIVER NEAR KELSO, ND (LAT 47 17 30N LONG 097 06 50W)											
MAR 31..	1	12	180	210	29	0.10	14	575	530	99.7	0.78
05065500 GOOSE RIVER NEAR PORTLAND, ND (LAT 47 32 20N LONG 097 27 20W)											
APR 04..	1	8.3	177	260	22	0.20	14	576	575	535	0.78
05083000 TURTLE RIVER AT MANVEL, ND (LAT 48 04 43N LONG 097 11 03W)											
APR 04..	5	14	170	300	320	0.30	18	1150	1110	1240	1.56
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR 07..	0.5	7.0	160	76	19	0.10	18	293	301	8960	0.40
SOURIS RIVER BASIN											
05119410 BONNES COULEE NEAR VELVA, ND (LAT 48 03 30N LONG 100 57 00W)											
MAY 02..	6	15	480	950	16	0.20	4.8	1940	1840	10.6	2.64
KNIFE RIVER BASIN											
06339490 ELM CREEK NEAR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 07..	8	19	200	560	7.1	0.20	7.6	1080	1030	8.89	1.47
06340200 WEST BRANCH OTTER CREEK NEAR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR 29..	5	13	226	570	7.3	0.20	8.4	1080	1060	12.5	1.47
HEART RIVER BASIN											
06343000 HEART RIVER NEAR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 03..	9	18	270	950	22	0.20	7.6	1700	1670	121	2.31
06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND (LAT 46 42 11N LONG 101 12 37W)											
APR 11..	5	8.2	330	370	9.4	0.30	3.9	907	881	152	1.23

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)
RED RIVER OF THE NORTH BASIN										
05056060 MAUVIAS COULEE TRIB NO. 3 NEAR CANDO (LAT 48 27 28N LONG 099 14 06W)										
APR 06..	4	150	30	1	28	610	0.3	2	2	290
05056244 ST. JOE COULEE NEAR WEBSTER, ND (LAT 48 19 23N LONG 099 00 19W)										
APR 05..	8	190	30	1	29	20	0.1	5	2	290
05060510 CASS COUNTY DRAIN NO. 52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)										
MAR 30..	4	140	190	<1	11	10	0.1	1	1	110
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)										
APR 05..	3	170	30	<1	50	50	0.4	1	2	310
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)										
APR 05..	4	110	60	<1	12	10	0.4	1	1	120
05062200 ELM RIVER NEAR KELSO, ND (LAT 47 17 30N LONG 097 06 50W)										
MAR 31..	5	190	20	<1	64	110	0.1	1	2	360
05065500 GOOSE RIVER NEAR PORTLAND, ND (LAT 47 32 20N LONG 097 27 20W)										
APR 04..	2	170	40	<1	36	190	0.2	2	3	320
05083000 TURTLE RIVER AT MANVEL, ND (LAT 48 04 43N LONG 097 11 03W)										
APR 04..	2	340	50	1	95	310	0.4	2	3	1100
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)										
APR 07..	2	140	40	1	18	20	0.4	2	2	190
SOURIS RIVER BASIN										
05119410 BONNES COULEE NEAR VELVA, ND (LAT 48 03 30N LONG 100 57 00W)										
MAY 02..	2	360	30	<1	190	80	0.1	0	3	1100
KNIFE RIVER BASIN										
06339490 ELM CREEK NEAR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)										
MAR 07..	2	180	270	<1	26	110	0.1	1	1	430
06340200 WEST BRANCH OTTER CREEK NEAR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)										
MAR 29..	1	230	200	<1	36	280	<0.1	1	1	750
HEART RIVER BASIN										
06343000 HEART RIVER NEAR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)										
MAR 03..	3	540	140	<1	30	850	0.1	2	1	700
06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND (LAT 46 42 11N LONG 101 12 37W)										
APR 11..	1	340	20	<1	49	10	<0.1	2	2	630

MISCELLANEOUS TEMPERATURE AND SPECIFIC CONDUCTIVITY MEASUREMENTS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)
RED RIVER OF THE NORTH BASIN					
05056403 COMSTOCK COULEE NEAR MINNEWAUKAN, ND					
MAR 24...	1425	0.24	720	2.5	0.5
APR 06...	1520	0.01	970	20.5	7.0
05116150 DES LACS RIVER NEAR KENMARE, ND					
OCT 06...	1515	0.03	2050	12.0	11.5
MAY 03...	1900	0.08	1990	11.5	9.5
JUN 14...	1345	0.08	1720	14.5	14.5
05123900 BOUNDARY CREEK NEAR LANDA, ND					
APR 13...	0940	1.0	1180	4.5	7.5
MAY 05...	0915	0.02	763	7.0	7.5

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	13.78	JUN 08	14.29	JUL 26	15.04	AUG 15	15.38
FEB 29	14.90						

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, 33.80 ft below land-surface datum, Mar. 15, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	30.98	JUNE 2	31.54	JUL 15	31.84	AUG 16	32.20
MAR 1	31.31						

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	8.08	JUNE 8	9.27	JULY 14	8.66	AUG 16	8.59
MAR 2	8.54						

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, 272.15 ft below land-surface datum, Nov. 17, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
NOV 17	272.15

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	22.70	FEB 13	22.57	MAY 26	25.66	AUG 31	26.85
NOV 6	22.67	MAR 30	22.61	JULY 4	26.94	SEPT 29	25.43
DEC 9	22.64	APR 29	22.59	28	29.49		

CASS COUNTY

464359096541301. Local number, 138-049-29CCC.
LOCATION.--Lat 46°43'59", long 096°54'13", Hydrologic Unit 09020105.
Owner: North Dakota State Water Commission.
AQUIFER.--West Fargo.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 317 ft, cased to 278 ft, plastic pipe, screens set at 278 to 280 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1983.
DATUM.--Altitude of land-surface datum is 912 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--August 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.90 ft below land-surface datum, Oct. 1, 1964; lowest measured, 61.92 ft below land-surface datum, Aug. 22, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	61.13	NOV 29	61.11	APR 2	60.56	JUNE 25	61.47
31	61.13	DEC 19	60.95	30	60.78	JULY 23	61.73
NOV 28	61.11	21	60.22	MAY 28	61.09	AUG 22	61.92

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, 14.40 ft below land-surface datum, Aug. 9, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	14.08	FEB 17	13.99	MAY 3	14.09	AUG 9	14.40

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	93.19	FEB 12	93.08	MAY 20	92.86	AUG 16	93.39

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	44.88	MAY 16	44.74	JULY 7	47.56	AUG 24	48.34

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, 0.40 ft below land-surface datum, Dec. 10, 1986; lowest measured, 8.32 ft below land-surface datum, Sept. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	2.80	APR 11	2.47	JUNE 14	3.95	SEPT 12	6.04

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 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.97 ft below land-surface datum, July 23, 1987; lowest measured, 7.96 ft below land-surface datum, Mar. 7, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 30	3.63	MAR 8	4.91	JUNE 22	4.43	SEPT 6	6.65

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	52.67	MAY 4	50.08	AUG 11	90.80

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	26.37	MAY 4	26.42	AUG 11	81.92

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 4	4.24	AUG 11	5.09

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	144.17	MAR 2	144.10	JUNE 2	144.19	AUG 30	144.11

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	19.98	APR 2	20.04	JUNE 27	22.88	SEPT 30	21.35
NOV 16	19.96	28	19.97	JULY 30	24.07		
DEC 13	19.99	MAY 25	21.55	AUG 26	21.72		

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	36.78	APR 14	37.75	JUNE 21	37.76	AUG 23	38.44
NOV 3	37.04	MAY 20	37.41	JULY 21	38.13	SEPT 27	38.87
DEC 8	37.27						

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, 201.85 ft below land-surface datum, Aug. 6, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	198.70	MAR 29	198.74	MAY 31	198.82	SEPT 1	198.25

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, 8.14 ft below land-surface datum, June 21, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 4	7.42	MAR 22	7.22	JUNE 21	8.14

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, 32.80 ft below land-surface datum, July 8, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	31.85	MAY 16	31.84	JULY 8	32.80

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, 9.01 ft below land-surface datum, Sept. 17, 18, 1988.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MAXIMUM VALUES (DAILY-LOW WATER-LEVEL)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.29	8.32	8.33	8.43	8.61	8.03	7.61	7.43	7.66	8.44	8.52	8.92
10	8.31	8.32	8.32	8.48	8.66	7.80	7.58	7.50	7.88	8.51	8.61	8.97
15	8.31	8.33	8.31	8.51	8.69	7.77	7.53	7.58	7.93	7.96	8.64	9.00
20	8.30	8.33	8.34	8.54	8.71	7.73	7.47	7.64	8.08	8.09	8.71	8.81
25	8.30	8.33	8.37	8.55	8.64	7.66	7.45	7.55	8.18	8.31	8.79	8.76
EOM	8.32	8.32	8.40	8.59	8.41	7.64	7.44	7.45	8.31	8.56	8.86	8.74
MAX	8.32	8.33	8.40	8.59	8.71	8.28	7.64	7.64	8.31	8.56	8.86	9.01

WATER YEAR 1988 HIGHEST WATER LEVEL 7.39 MAY 29 LOWEST WATER LEVEL 9.01 SEPTEMBER 17, 18

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, 20.41 ft below land-surface datum, Mar. 21, 1969. During well construction a measurement of 27.23 ft below land-surface datum was made (Dec. 10, 1968), but was not considered to be the result of natural conditions.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	18.08	JAN 21	18.28	APR 22	17.69	JULY 21	18.77
NOV 23	18.10	FEB 22	18.43	MAY 20	17.75	AUG 22	19.23
DEC 21	18.09	MAR 22	18.00	JUNE 23	18.36	SEPT 20	19.56

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, 16.20 ft below land-surface datum, Apr. 23, 1984; lowest measured, 24.33 ft below land-surface datum, Aug. 6, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	19.68	DEC 3	20.11	MAY 14	20.03	AUG 8	23.39
31	20.02	MAR 20	19.97	JUNE 11	22.18	SEPT 5	23.17
NOV 29	19.97	APR 17	19.55	JULY 10	23.57		

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	15.75	DEC 2	15.64	JUNE 9	16.34	JULY 29	16.57
NOV 3	15.64	APR 7	16.14	JULY 6	16.48	AUG 31	16.71

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.
REVISIONS.--Water levels for water year 1987 have been revised superseding figures published in report ND-87-1.

WATER LEVEL, IN FEET ABOVE (+) AND BELOW (-) LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24, 1986	+0.14	JULY 10, 1987	+0.15	SEPT 15, 1987	+1.36

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 ABOVE (+) AND BELOW (-) LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
JUNE 20	+0.14	AUG 24	-1.70

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 8	5.88	MAR 21	5.72	JUNE 22	6.00	SEPT 9	6.15

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 8	91.09	MAR 21	91.15	JUNE 22	91.24	SEPT 9	91.32

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, 9.15 ft below land-surface datum, Mar. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 30	4.39	MAR 8	5.00	JUNE 15	4.86	SEPT 6	6.68

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 (corrected), June 17, 1965; lowest measured, 16.28 ft below land-surface datum, Sept. 24, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 9	14.90	MAR 27	14.80	JUNE 26	15.56	SEPT 24	16.28
13	14.86						

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 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	64.68	MAY 16	64.59	JULY 8	64.52

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, 23.99 ft below land-surface datum, Aug. 9, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	20.35	FEB 17	20.29	MAY 3	20.40	AUG 9	23.99

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	COUNTY	GEO-LOGIC UNIT	DEPTH OF WELL, TOTAL (FEET) (72008)	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)
			BOWMAN COUNTY						
460705103005301	130-099-01BBB	011	125TGRV	60.00	08-25-88	1215	27.21	2480	8.60
460645103021801	130-099-03ADD	011	125TGRV	64.00	08-26-88	0950	3.64	5590	8.20
460705103025601	130-099-03BAA	011	125TGRV	70.00	08-25-88	0905	20.13	6200	8.60
460645103033302	130-099-04ADD2	011	125TGRV	50.00	08-24-88	1710	16.66	6650	6.80
460705103041101	130-099-04BAA	011	125TGRV	47.00	08-30-88	1430	11.75	4000	7.00
461355103055701	131-099-19DDD	011	125TGRV	74.00	08-29-88	1300	26.35	2430	8.40
460902103043601	131-099-21CCB1	011	125HRMN	80.00	08-29-88	1610	56.74	1700	7.20
461355103043303	131-099-21CCC3	011	125TGRV	152.00	08-29-88	1825	74.39	1690	8.90
460856103024401	131-099-22DCC1	011	125TGRV	76.00	08-26-88	1305	43.84	4080	7.30
		011	125TGRV	76.00	08-26-88	[a]1306	43.84	4080	7.30
460856103020701	131-099-23CCC1	011	125TGRV	170.00	08-25-88	1540	76.70	1420	8.80
460856103020702	131-099-23CCC2	011	125HRMN	100.00	08-25-88	1635	74.28	2680	8.40
460804103010101	131-099-26DDC1	011	125HRMN	76.00	08-03-88	1745	45.49	1320	8.60
460843103032001	131-099-27BBC1	011	125TRVL	86.00	08-04-88	1905	54.62	4000	7.70
460843103032003	131-099-27BBC3	011	125TGRV	160.00	08-04-88	1650	58.58	1490	9.00
460823103030301	131-099-27CAB	011	125TGRV	38.00	08-05-88	1130	19.34	4300	7.00
460816103032701	131-099-27CBC1	011	125TGRV	80.00	08-17-88	1145	54.86	2870	7.70
460816103032702	131-099-27CBC2	011	125HRMN	60.00	08-17-88	1325	55.14	2800	7.70
460830103044504	131-099-29ADD4	011	125TGRV	80.00	08-16-88	1720	58.28	1900	8.00
460849103053201	131-099-29BAB	011	125TGRV	33.00	08-16-88	1015	19.76	5490	7.30
460834103055501	131-099-29BCC	011	125TGRV	53.00	08-16-88	1510	12.84	1770	9.30
460823103053201	131-099-29CAB	011	125TGRV	30.00	08-16-88	1125	8.94	5880	6.80
460804103052301	131-099-29CDD	011	125HRMN	32.00	08-16-88	1300	14.46	9350	6.70
460810103051301	131-099-29DCB	011	125TGRV	22.00	08-15-88	1645	15.65	5110	6.80
460751103044501	131-099-32AAD	011	125TGRV	23.00	08-16-88	1810	12.58	7180	6.60
460725103051301	131-099-32DBC1	011	125TGRV	30.00	08-30-88	1110	11.67	3020	8.20
460718103045501	131-099-32DDB	011	125TRVL	65.00	08-30-88	1310	11.22	2810	7.60
460747103032902	131-099-33ADA2	011	125TGRV	38.00	08-17-88	1620	6.09	2660	8.40
460747103032903	131-099-33ADA3	011	125TGRVL	76.00	08-17-88	1715	5.83	2420	8.80
460757103021601	131-099-34AAA	011	125TGRVL	41.00	08-05-88	1000	21.92	5700	11.80
460744103014801	131-099-35BDB1	011	125TGRV	78.00	08-22-88	1645	35.35	1370	8.90

a - Split sample analysis for quality assurance.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	DATE	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)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)
					BOWMAN COUNTY						
460705103005301	08-25-88	22.0	9.5	2.3	22	100	16	15	540	92	24
460645103021801	08-26-88	22.0	11.0	5.2	54	210	17	40	2000	95	61
460705103025601	08-25-88	21.0	7.5	2.3	22	140	16	23	1600	96	61
460645103033302	08-24-88	33.0	8.0	2.5	24	2100	190	390	1400	59	14
460705103041101	08-30-88	32.0	11.5	1.5	16	720	130	95	810	71	13
461355103055701	08-29-88	26.0	8.5	2.2	21	88	12	14	540	93	26
460902103043601	08-29-88	26.0	9.0	--	--	980	210	110	58	11	0.8
461355103043303	08-29-88	23.0	9.5	--	--	22	5.4	1.9	400	97	39
460856103024401	08-26-88	27.0	8.5	4.4	43	1700	300	220	510	40	6
	08-26-88	27.0	8.5	4.4	43	1700	300	220	530	41	6
460856103020701	08-25-88	25.0	9.0	5.0	48	26	5.5	3.0	280	96	25
460856103020702	08-25-88	25.0	9.0	--	--	51	11	8.0	620	95	36
460804103010101	08-03-88	18.0	9.5	--	--	17	3.5	2.0	320	97	35
460843103032001	08-04-88	28.0	10.5	2.7	27	380	44	64	1100	85	25
460843103032003	08-04-88	28.0	10.5	--	--	21	5.7	1.7	410	97	40
460823103030301	08-05-88	33.0	9.5	3.1	31	2100	380	280	370	28	4
460816103032701	08-17-88	26.0	9.5	--	--	300	52	41	560	80	14
460816103032702	08-17-88	26.0	9.5	--	--	330	54	46	550	78	14
460830103044504	08-16-88	30.0	9.0	--	--	150	28	19	390	84	14
460849103053201	08-16-88	25.0	9.5	4.2	42	2700	470	370	700	36	6
460834103055501	08-16-88	32.0	8.5	2.0	19	23	5.9	2.0	420	97	39
460823103053201	08-16-88	29.0	12.5	1.6	17	1400	270	180	1200	64	14
460804103052301	08-16-88	30.0	8.5	--	--	2500	330	400	2200	66	20
460810103051301	08-15-88	34.0	10.0	3.2	32	1900	350	250	840	48	9
460751103044501	08-16-88	30.0	12.0	2.9	31	3800	510	600	940	35	7
460725103051301	08-30-88	24.0	11.0	2.9	30	220	50	23	670	86	20
460718103045501	08-30-88	30.0	11.0	--	--	590	100	82	510	65	9
460747103032902	08-17-88	28.0	8.0	--	--	120	23	15	630	91	26
460747103032903	08-17-88	28.0	8.0	2.6	24	26	6.0	2.6	600	98	53
460757103021601	08-05-88	28.0	9.5	5.3	53	410	26	84	1400	87	30
460744103014801	08-22-88	25.0	9.5	2.7	26	27	6.3	2.7	350	96	30

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	DATE	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)	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)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
					BOWMAN COUNTY						
460705103005301	08-25-88	4.9	533	720	7.7	1.5	8.1	1620	1630	2.20	--
460645103021801	08-26-88	12	455	3700	14	1.0	11	5720	6070	7.78	--
460705103025601	08-25-88	11	302	3400	13	0.70	10	5110	5260	6.95	--
460645103033302	08-24-88	12	234	4500	10	0.40	9.1	6810	6670	9.26	--
460705103041101	08-30-88	14	430	2000	8.1	0.10	10	3440	3340	4.68	1
461355103055701	08-29-88	5.8	457	780	5.6	0.70	7.8	1610	1640	2.19	--
460902103043601	08-29-88	9.8	261	780	14	0.30	11	1430	1350	1.94	--
461355103043303	08-29-88	2.4	634	490	24	2.5	10	1280	1320	1.74	--
460856103024401	08-26-88	14	500	2300	39	0.40	4.5	3810	3690	5.18	3
	08-26-88	12	494	2300	36	0.40	6.6	3940	3710	5.36	4
460856103020701	08-25-88	1.9	658	330	34	4.0	12	1070	718	1.46	--
460856103020702	08-25-88	5.0	462	930	5.4	1.8	7.0	1830	1870	2.49	--
460804103010101	08-03-88	2.4	436	280	7.4	2.1	9.4	893	889	1.21	--
460843103032001	08-04-88	33	720	2100	7.9	1.0	18	3800	3370	5.17	--
460843103032003	08-04-88	2.0	728	330	27	3.4	8.9	1220	1230	1.66	--
460823103030301	08-05-88	10	561	2300	14	0.30	13	4070	3710	5.54	--
460816103032701	08-17-88	9.6	454	1000	6.3	0.60	7.8	1960	1950	2.67	--
460816103032702	08-17-88	9.8	454	1000	6.0	0.60	8.0	1970	1950	2.68	--
460830103044504	08-16-88	11	467	500	5.1	0.40	11	1260	1250	1.71	--
460849103053201	08-16-88	12	253	4000	28	0.20	12	6120	5750	8.32	--
460834103055501	08-16-88	2.9	612	320	10	1.1	11	1140	1140	1.55	--
460823103053201	08-16-88	22	1050	2700	13	0.10	20	5110	5050	6.95	--
460804103052301	08-16-88	14	689	6300	5.6	0.20	9.7	10100	9690	13.7	--
460810103051301	08-15-88	37	650	3000	3.8	0.20	35	5090	4920	6.92	--
460751103044501	08-16-88	16	1110	4800	13	0.40	23	8420	7600	11.5	--
460725103051301	08-30-88	7.9	604	1100	7.4	1.2	7.3	2150	2230	2.92	--
460718103045501	08-30-88	12	416	1300	2.2	0.20	10	2220	2270	3.02	--
460747103032902	08-17-88	6.5	579	860	5.3	1.2	7.4	1860	1900	2.53	--
460747103032903	08-17-88	2.9	573	740	11	1.9	8.3	1680	1720	2.28	--
460757103021601	08-05-88	37	360	3000	30	0.40	5.0	4580	4800	6.23	--
460744103014801	08-22-88	2.0	580	380	34	3.1	8.7	1100	1140	1.50	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	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)
					BOWMAN COUNTY					
460705103005301	08-25-88	1300	190	--	40	70	--	6	--	480
460645103021801	08-26-88	1200	30	--	100	160	--	1	--	2700
460705103025601	08-25-88	950	30	--	90	60	--	<1	--	2100
460645103033302	08-24-88	4900	7800	--	390	2600	--	<1	--	6100
460705103041101	08-30-88	2800	1300	<1	250	550	<1.0	<1	<1	3700
461355103055701	08-29-88	930	60	--	40	60	--	1	--	320
460902103043601	08-29-88	280	41	--	54	230	--	4	--	2700
461355103043303	08-29-88	1100	410	--	7	49	--	<1	--	170
460856103024401	08-26-88	420	40	1	110	440	<1.0	32	<1	4300
	08-26-88	510	20	6	100	450	<0.1	21	<1	4400
460856103020701	08-25-88	1200	500	--	23	57	--	<1	--	140
460856103020702	08-25-88	820	60	--	40	30	--	<1	--	420
460804103010101	08-03-88	890	80	--	8	18	--	<1	--	87
460843103032001	08-04-88	1200	100	--	80	160	--	<1	--	3400
460843103032003	08-04-88	1200	660	--	9	68	--	<1	--	190
460823103030301	08-05-88	1400	230	--	90	3400	--	2	--	4100
460816103032701	08-17-88	1600	50	--	50	60	--	<1	--	2200
460816103032702	08-17-88	1600	120	--	50	60	--	<1	--	2400
460830103044504	08-16-88	980	78	--	39	35	--	<1	--	980
460849103053201	08-16-88	470	30	--	110	90	--	<1	--	3500
460834103055501	08-16-88	810	140	--	6	14	--	<1	--	160
460823103053201	08-16-88	3500	240	--	130	570	--	<1	--	6700
460804103052301	08-16-88	8600	190	--	120	360	--	<1	--	9000
460810103051301	08-15-88	4600	340	--	160	460	--	<1	--	7900
460751103044501	08-16-88	19000	230	--	220	2300	--	<1	--	10000
460725103051301	08-30-88	880	220	--	30	150	--	8	--	870
460718103045501	08-30-88	3100	50	--	140	190	--	<1	--	3100
460747103032902	08-17-88	1100	20	--	40	30	--	<1	--	850
460747103032903	08-17-88	1000	50	--	30	20	--	<1	--	220
460757103021601	08-05-88	310	30	--	80	10	--	22	--	1600
460744103014801	08-22-88	1200	370	--	10	71	--	<1	--	200

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 SW¼NW¼SW¼ 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.

COOPERATION.--Onsite observers are provided by the North Dakota State Parks and Recreation Department.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS (00400)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
10/01 to 10/06	0.08	88	9.4	5.77	0.786	0.179
10/06 to 10/13	0.0	0.0	1.4[a]	5.62[a]	0.017[a]	<0.001[a]
10/13 to 10/20	0.02	150	16.7[b]	6.53[b]	0.365	0.094
10/20 to 10/27	0.46	61	5.1	5.35	0.147	0.034
10/27 to 11/03	0.0	0.0	--	--	--	--
11/03 to 11/10	0.0	0.0	--	--	--	--
11/10 to 11/17	0.28	96	17.1	5.04	0.460	0.053
11/17 to 11/24	0.0	0.0	--	--	--	--
11/24 to 12/01	0.0	0.0	--	--	--	--
12/01 to 12/08	0.26	58	12.7	4.78	0.223	0.043
12/08 to 12/15	0.12	>8.0	--	--	--	--
12/15 to 12/22	0.0	0.0	--	--	--	--
12/22 to 12/31						
12/31 to 01/05	0.05	>20	--	--	--	--
01/05 to 01/12	0.02	>50	21.6[b]	6.57[b]	--	--
01/12 to 01/19	0.15	107	11.3	4.75	0.313	0.062
01/19 to 01/26	0.25	>4.0	30.0[b]	7.22[b]	--	--
01/26 to 02/02	0.11	>9.1	--	6.20[b]	--	--
02/02 to 02/09	0.05	>20	--	--	--	--
02/09 to 02/16	0.10	>10	--	5.71[b]	--	--
02/16 to 02/23	0.05	20	17.1[b]	6.64[b]	1.404	0.236
02/23 to 03/01	0.02	50	8.2[b]	6.51[b]	0.546	0.081
03/01 to 03/08	0.40	45	14.9	5.28	0.263	0.054
03/08 to 03/15	0.25	12	23.0[b]	6.32[b]	0.852	0.184
03/15 to 03/22	0.03	>33	15.2[b]	6.30[b]	<0.509[b]	<0.170[b]
03/22 to 03/29	0.15	80	13.5	5.21	0.393	0.062
03/29 to 04/05	<0.01	100	--	--	--	--
04/05 to 04/12	0.0	0.0	--	--	--	--
04/12 to 04/19	0.0	0.0	3.9[a]	5.56[a]	0.280[a]	0.023[a]
04/19 to 04/26	0.0	0.0	--	--	--	--
04/26 to 05/03	0.0[c]	0.0	212.2	8.11	--	--
05/03 to 05/10	0.65	97	28.9	6.49	5.000	0.762

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 Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. To provide for an adequate sample, 50 milliliters of dilution water was added.

b Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

c 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 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS (00400)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
05/10 to 05/17	0.20	100	23.7	5.95	1.345	0.369
05/17 to 05/24	0.80	98	12.6	5.90	0.773	0.130
05/24 to 05/31	0.12	92	27.0	5.72	1.899	0.358
05/31 to 06/07	0.0	0.0	7.0[a]	4.95[a]	0.110[a]	0.027[a]
06/07 to 06/14	0.17	94	6.0	5.39	0.351	0.081
06/14 to 06/21	0.49	90	6.3	5.61	0.317	0.076
06/21 to 06/28	0.05	200	29.5	5.86	1.356	0.271
06/28 to 07/05	1.50	103	10.5	5.10	0.159	0.029
07/05 to 07/12	1.30	98	13.6	5.51	0.552	0.106
07/12 to 07/19	0.24	96	13.6	5.89	0.743	0.134
07/19 to 07/26	<0.01	100	--	--	--	--
07/26 to 08/02	0.01	500	31.9	5.81	3.460	0.828
08/02 to 08/09	0.0	0.0	--	--	--	--
08/09 to 08/16	1.00	110	7.0	5.45	0.172	0.034
08/16 to 08/23	0.14	100	20.5	5.61	1.270	0.200
08/23 to 08/30	0.0	0.0	--	--	--	--
08/30 to 09/06	0.0	0.0	2.9[a]	5.67[a]	0.095[a]	0.016[a]
09/06 to 09/13	0.75	97	40.8	6.00	2.986	0.416
09/13 to 09/20	0.31	77	13.2	5.11	0.200	0.037
09/20 to 09/27	0.0	0.0	--	--	--	--

a Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. To provide for an adequate sample, 50 milliliters of dilution water was added.

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)
10/01 to 10/06	0.090	0.132	0.130	1.100	0.420	0.100	<0.007
10/06 to 10/13	<0.003[a]	0.016[a]	0.040[a]	<0.030[a]	<0.020[a]	<0.010[a]	<0.007[a]
10/13 to 10/20	0.055	0.287	0.170	2.200	1.15	0.260	<0.007
10/20 to 10/27	0.016	0.069	0.070	0.600	0.190	0.150	<0.007
10/27 to 11/03	--	--	--	--	--	--	--
11/03 to 11/10	--	--	--	--	--	--	--
11/10 to 11/17	0.026	0.042	0.080	2.300	0.920	0.500	<0.007
11/17 to 11/24	--	--	--	--	--	--	--
11/24 to 12/01	--	--	--	--	--	--	--
12/01 to 12/08	0.008	0.111	0.120	1.300	0.270	0.350	<0.007
12/08 to 12/15	--	--	--	--	--	--	--
12/15 to 12/22	--	--	--	--	--	--	--
12/22 to 12/31	--	--	--	--	--	--	--
12/31 to 01/05	--	--	--	--	--	--	--
01/05 to 01/12	--	--	--	--	--	--	--
01/12 to 01/19	0.220	0.292	0.450	0.830	0.060	0.230	<0.007
01/19 to 01/26	--	--	--	--	--	--	--
01/26 to 02/02	--	--	--	--	--	--	--
02/02 to 02/09	--	--	--	--	--	--	--
02/09 to 02/16	--	--	--	--	--	--	--
02/16 to 02/23	0.090	0.195	<0.210	1.700	<0.110	<0.050	<0.046
02/23 to 03/01	0.030	0.141	0.210	0.680	<0.070	<0.030	<0.028
03/01 to 03/08	0.030	0.587	0.070	2.800	0.630	0.250	<0.007
03/08 to 03/15	0.063	0.178	0.170	3.000	1.30	0.990	0.013
03/15 to 03/22	<0.170	0.622	<1.700	<1.700	<0.880	<0.380	<0.377
03/22 to 03/29	0.033	0.160	0.190	0.960	0.670	0.580	0.013
03/29 to 04/05	--	--	--	--	--	--	--
04/05 to 04/12	--	--	--	--	--	--	--
04/12 to 04/19	0.022[a]	0.065[a]	0.050[a]	0.210[a]	<0.020[a]	0.010[a]	0.037[a]
04/19 to 04/26	--	--	--	--	--	--	--
04/26 to 05/03	--	--	--	--	--	--	--
05/03 to 05/10	0.115	0.126	0.220	3.200	0.320	0.420	<0.007
05/10 to 05/17	0.149	1.500	0.100	4.300	0.260	0.360	0.020
05/17 to 05/24	0.073	0.121	0.080	1.400	0.060	0.320	<0.007
05/24 to 05/31	0.130	0.230	0.340	3.400	1.13	1.29	0.030
05/31 to 06/07	0.021[a]	0.038[a]	<0.030[a]	0.130[a]	<0.020[a]	<0.010[a]	<0.007[a]
06/07 to 06/14	0.012	0.109	0.090	0.490	0.020	0.260	<0.007
06/14 to 06/21	0.016	0.067	0.070	0.560	0.030	0.020	0.010
06/21 to 06/28	0.852	0.285	1.100	3.200	1.65	1.15	<0.007
06/28 to 07/05	0.023	0.034	0.070	1.200	0.430	0.260	<0.007
07/05 to 07/12	0.063	0.083	0.130	1.500	0.460	0.440	<0.007
07/12 to 07/19	0.028	0.466	0.200	1.200	0.050	0.480	<0.007
07/19 to 07/26	--	--	--	--	--	--	--
07/26 to 08/02	0.395	0.281	0.350	3.500	1.22	1.27	<0.007
08/02 to 08/09	--	--	--	--	--	--	--
08/09 to 08/16	0.021	0.038	0.060	0.670	0.300	0.230	<0.007
08/16 to 08/23	0.189	0.144	0.260	2.700	0.400	0.690	<0.007
08/23 to 08/30	--	--	--	--	--	--	--
08/30 to 09/06	0.012[a]	0.030[a]	0.190[a]	0.060[a]	<0.020[a]	0.030[a]	<0.007[a]
09/06 to 09/13	0.330	0.260	0.190	5.200	1.27	0.980	<0.007
09/13 to 09/20	0.023	0.053	0.090	1.700	0.810	0.480	0.017
09/20 to 09/27	--	--	--	--	--	--	--

a Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. 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 SE1/4SW1/4SW1/4 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.

COOPERATION.--Onsite observers are provided by the U.S. Fish and Wildlife Service.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS (00400)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
10/01 to 10/06	0.0	--	--	--	--	--
10/06 to 10/13	0.0	0.0	--	--	--	--
10/13 to 10/20	0.02	--	39.3[a]	6.96[a]	1.308	0.259
10/20 to 10/27	0.0	0.0	6.09[b]	7.32[b]	2.695[b]	0.415[b]
10/27 to 11/03	0.0	0.0	3.3[b]	6.35[b]	0.231[b]	0.052[b]
11/03 to 11/10	0.0[c]	0.0	31.2	7.02	--	--
11/10 to 11/17	0.05	60	26.9[a]	6.78[a]	1.081	0.200
11/17 to 11/24	0.0	0.0	--	--	--	--
11/24 to 12/01	0.15	80	11.0	5.03	0.491	0.132
12/01 to 12/08	0.20	95	14.8	5.86	0.510	0.078
12/08 to 12/15	0.04	>25	--	--	--	--
12/15 to 12/22	0.0	0.0	--	--	--	--
12/22 to 12/29	0.02	0.0	1.3[a]	5.67[a]	0.022	0.008
12/29 to 01/05	0.03	>33	--	--	--	--
01/05 to 01/12	0.42	2.4	31.1[a]	7.06[a]	3.002	0.525
01/12 to 01/19	0.02	>50	37.4[a]	5.19[a]	0.929	0.220
01/19 to 01/26	0.07	>14	120.2[a]	7.86[a]	12.500	2.003
01/26 to 02/02	0.10	20	20.8[a]	6.00[a]	1.462	0.313
02/02 to 02/09	0.28	>3.6	--	--	--	--
02/09 to 02/16	--	--	--	--	--	--
02/16 to 02/23	0.0	0.0	12.8[b]	6.75[b]	1.205[b]	0.254[b]
02/23 to 03/01	0.07	>14	20.7[a]	6.72[a]	0.476	0.084
03/01 to 03/08	0.05	80	32.7	5.53	1.452	0.247
03/08 to 03/15	0.52	71	11.0	6.41[a]	0.642	0.103
03/15 to 03/22	0.0	0.0	--	--	--	--
03/22 to 03/29	0.02	>50	92.8[a]	7.03[a]	1.147	0.145
03/29 to 04/05	--	--	3.7[a]	6.37[a]	0.324	0.072
04/05 to 04/12	0.0	0.0	2.6[b]	5.85[b]	0.139[b]	0.032[b]
04/12 to 04/19	0.0	0.0	2.0[b]	5.70[b]	0.103[b]	0.026[b]
04/19 to 04/26	0.0	0.0	--	--	--	--
04/26 to 05/03	0.0	0.0	42.3[b]	6.66[b]	2.129[b]	0.354[b]
05/03 to 05/10	0.03	--	29.6[a]	7.06[a]	2.470	0.262

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 Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

b Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. To provide for an adequate sample, 50 milliliters of dilution water was added.

c Trace of water collected in field sampler.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS (00400)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
05/10 to 05/17	0.10	--	18.4[a]	6.41[a]	0.926	0.177
05/17 to 05/24	0.15	100	22.5	5.49	1.156	0.208
05/24 to 05/31	--	--	11.2	5.67	0.746	0.158
05/31 to 06/07	0.0	0.0	3.0[b]	5.54[b]	0.088[b]	0.012[b]
06/07 to 06/14	--	--	17.0	4.92	0.489	0.093
06/14 to 06/21	0.31	94	11.7	6.31[a]	0.596	0.086
06/21 to 06/28	0.50	94	14.3	6.58[a]	0.756	0.166
06/28 to 07/05	0.05	100	18.3	5.14	0.925	0.193
07/05 to 07/12	0.30	107	8.1	5.24	0.244	0.029
07/12 to 07/19	0.41	100	10.5[a]	6.39[a]	0.455	0.090
07/19 to 07/26	0.11	91	9.9	5.11	0.562	0.142
07/26 to 08/02	1.32	106	17.3	4.86	0.502	0.072
08/02 to 08/09	0.64	102	6.9	6.21	0.164	0.038
08/09 to 08/16	0.85	92	10.3[a]	5.39	0.397	0.084
08/16 to 08/23	0.03	67	35.4[a]	6.78[a]	1.730	0.302
08/23 to 08/30	0.0	0.0	2.3[b]	5.49[b]	0.036[b]	0.012[b]
08/30 to 09/06	0.07	114	79.7	6.45	5.170	0.605
09/06 to 09/13	<0.01	<400	44.7[a]	7.06[a]	3.340	0.449
09/13 to 09/20	0.70	86	11.9	5.18	0.143	0.023
09/20 to 09/27	0.0	0.0	1.4[b]	5.48[b]	0.017[b]	0.005[b]

a Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

b Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. To provide for an adequate sample, 50 milliliters of dilution water was added.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

PERIOD OF COLLECTION	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHOROUS DISSOLVED (MG/L AS P) (00666)
10/01 to 10/06	--	--	--	--	--	--	--
10/06 to 10/13	--	--	--	--	--	--	--
10/13 to 10/20	1.015	2.480	3.200	4.100	<0.110	0.490	<0.045
10/20 to 10/27	0.760[b]	0.857[b]	1.500[b]	4.000[b]	<0.220[b]	<0.090[b]	<0.092[b]
10/27 to 11/03	0.080[b]	0.111[b]	0.190[b]	0.070[b]	<0.020[b]	<0.010[b]	<0.007[b]
11/03 to 11/10	--	--	--	--	--	--	--
11/10 to 11/17	0.289	1.240	0.840	3.400	1.15	0.910	<0.007
11/17 to 11/24	--	--	--	--	--	--	--
11/24 to 12/01	0.086	0.297	0.230	1.200	0.670	0.540	<0.007
12/01 to 12/08	0.074	0.217	0.280	2.000	0.860	0.720	<0.007
12/08 to 12/15	--	--	--	--	--	--	--
12/15 to 12/22	--	--	--	--	--	--	--
12/22 to 12/29	0.007	0.024	0.050	<0.030	<0.020	<0.010	<0.007
12 29 to 01/05	--	--	--	--	--	--	--
01/05 to 01/12	0.232	0.384	0.430	1.900	<0.090	<0.040	<0.041
01/12 to 01/19	2.326	1.748	2.700	3.400	<0.110	<0.050	0.069
01/19 to 01/26	2.702	2.880	3.400	5.600	<0.160	<0.070	<0.070
01/26 to 02/02	0.176	0.388	0.370	2.400	0.230	1.00	0.023
02/02 to 02/09	--	--	--	--	--	--	--
02/09 to 02/16	--	--	--	--	--	--	--
02/16 to 02/23	0.263[b]	0.097[b]	0.100[b]	1.200[b]	0.180[b]	0.210[b]	0.013[b]
02/23 to 03/01	0.233	0.485	0.470	1.100	<0.150	<0.060	<0.062
03/01 to 03/08	0.984	1.360	1.600	4.600	2.17	1.07	<0.007
03/08 to 03/15	0.060	0.096	0.120	1.700	0.640	0.400	<0.007
03/15 to 03/22	--	--	--	--	--	--	--
03/22 to 03/29	0.162	1.454	<0.480	3.500	<0.250	<0.110	<0.108
03/29 to 04/05	0.027	0.041	0.040	0.240	<0.020	0.070	<0.007
04/05 to 04/12	0.015[b]	0.068[b]	0.050[b]	0.150[b]	0.020[b]	0.020[b]	0.027[b]
04/12 to 04/19	0.032[b]	0.043[b]	<0.030[b]	0.100[b]	0.090[b]	0.010[b]	0.062[b]
04/19 to 04/26	--	--	--	--	--	--	--
04/26 to 05/03	0.385[b]	0.304[b]	0.340[b]	6.400[b]	1.58[b]	1.83[b]	<0.007[b]
05/03 to 05/10	0.206	0.524	0.310	3.000	0.160	0.820	<0.007
05/10 to 05/17	0.094	0.390	0.120	3.100	0.300	0.520	<0.007
05/17 to 05/24	0.142	0.455	0.150	3.900	0.820	0.730	<0.007
05/24 to 05/31	0.067	0.096	0.080	1.100	<0.020	0.340	<0.007
05/31 to 06/07	0.016[b]	0.038[b]	0.230[b]	0.150[b]	<0.020[b]	<0.010[b]	0.027[b]
06/07 to 06/14	0.049	0.059	0.080	1.800	0.570	0.420	<0.007
06/14 to 06/21	0.085	0.078	0.140	1.400	<0.160	0.430	<0.007
06/21 to 06/28	0.041	0.097	0.100	1.400	0.510	0.470	<0.007
06/28 to 07/05	0.064	0.103	0.250	2.200	0.540	0.910	<0.007
07/05 to 07/12	<0.003	0.055	0.060	1.000	0.130	0.290	<0.007
07/12 to 07/19	0.042	0.095	0.100	1.200	<0.020	0.320	<0.007
07/19 to 07/26	0.009	0.201	0.120	1.500	<0.020	0.210	<0.007
07/26 to 08/02	0.058	0.067	0.120	1.300	0.570	0.430	<0.007
08/02 to 08/09	0.027	0.037	0.080	0.530	0.470	0.240	<0.007
08/09 to 08/16	0.056	0.050	0.090	1.000	0.590	0.430	<0.007
08/16 to 08/23	0.264	2.960	0.530	6.500	0.360	0.970	<0.007
08/23 to 08/30	0.026[b]	0.012[b]	0.040[b]	0.060[b]	<0.020[b]	0.040[b]	<0.007[b]
08/30 to 09/06	0.869	1.520	0.670	6.200	2.09	1.49	<0.007
09/06 to 09/13	0.389	0.991	0.580	5.900	0.680	1.07	<0.007
09/13 to 09/20	0.024	0.054	0.060	1.200	0.780	0.310	<0.007
09/20 to 09/27	<0.003[b]	0.063[b]	0.050[b]	<0.030[b]	<0.020[b]	<0.010[b]	<0.007[b]

b Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. 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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