# SUMMARIES OF WATER-QUALITY DATA COLLECTED DURING 1979-87 FOR SELECTED JAMES RIVER AND REFUGE LOCATIONS IN NORTH DAKOTA AND SOUTH DAKOTA

By L. I. Briel

---

U.S. GEOLOGICAL SURVEY

Open-File Report 88-732

Prepared in cooperation with the

U.S. BUREAU OF RECLAMATION

Bismarck, North Dakota

1988

UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

---

For additional information write to:

District Chief
U.S. Geological Survey
Water Resources Division
821 East Interstate Avenue
Bismarck, ND 58501

Copies of this report can be purchased from:

U.S. Geological Survey
Books and Open-File Reports
Federal Center, Bldg. 810
Box 25425
Denver, CO 80225

CONTENTS



ILLUSTRATIONS



TABLES

TABLES, Continued

## SELECTED FACTORS FOR CONVERTING INCH-POUND UNITS

## TO METRIC UNITS

For those readers who may prefer to use metric units rather than inch-pound units, the conversion factors for the terms used in this report are given below.

| Multiply inch-pound unit | by | To obtain metric unit |
|---|---|---|
| Cubic foot per second | 0.02832 | cubic meter per second |
| Inch | 25.40 | millimeter |
| Tons per acre-foot | .7355 | kilogram per cubic meter |
| Tons per day | 907.2 | kilogram per day |

To convert degrees Celsius (°C) to degrees Fahrenheit (°F), use the following formula: $°F = 9/5(°C)+32$.

# SUMMARIES OF WATER-QUALITY DATA COLLECTED DURING 1979-87 FOR SELECTED JAMES RIVER AND REFUGE LOCATIONS IN NORTH DAKOTA AND SOUTH DAKOTA

By L. I. Briel

## ABSTRACT

*Water-quality data were collected during 1979-87 at selected locations in the central part of the James River basin, North and South Dakota, by the U.S. Geological Survey and the U.S. Bureau of Reclamation to document baseline conditions in three wildlife refuges. These data are needed to determine potential impacts on water quality of augmented flows in the James River from proposed operation of the Garrison Diversion Unit. This report contains statistical summaries of 190 water-quality characteristics and constituents determined from samples collected at 10 main-stem gaging stations and 94 sampling sites in the study area. Characteristics and constituents are compared to State water-quality standards and the number of measurements exceeding each standard is noted. Seasonal or bimonthly means were calculated for selected characteristics and constituents and the amount of data available for each gaging station and pool is included.*

## INTRODUCTION

Operation of the Garrison Diversion Unit (the Unit) in North Dakota will divert water from the Missouri River into the upper James River basin to augment flows in the James River sufficiently to permit expanded irrigation and to provide additional water supplies for municipal and industrial use. Potential impacts of augmented flows on water quality in three wildlife refuges in the central part of the James River basin currently are being studied by the U.S. Geological Survey in cooperation with the U.S. Bureau of Reclamation.

This report contains summaries of water-quality data collected during 1979-87 in the central part of the James River basin in North Dakota and South Dakota (fig. 1). The U.S. Geological Survey collected water-quality and streamflow data from January 2, 1979, to November 18, 1987, at 10 James River main-stem gaging stations in the study area. The U.S. Bureau of Reclamation collected summer-season data from June 25, 1984, to August 20, 1987, at 94 refuge locations, including 48 sampling sites in the Arrowwood National Wildlife Refuge in North Dakota, 3 sampling sites in the Hyatt Slough State Wildlife Management Area in North Dakota, and 43 sampling sites in the Sand Lake National Wildlife Refuge in South Dakota. In this report, the 94 refuge sites have been aggregated into eight larger groupings, or "pools," to provide more reliable statistical values. The data base contains values for 190 water-quality characteristics and constituents, which have been grouped for convenience into seven categories: physical properties, major constituents, nutrients, trace elements, pesticides, chlorophyll data, and sediment data.

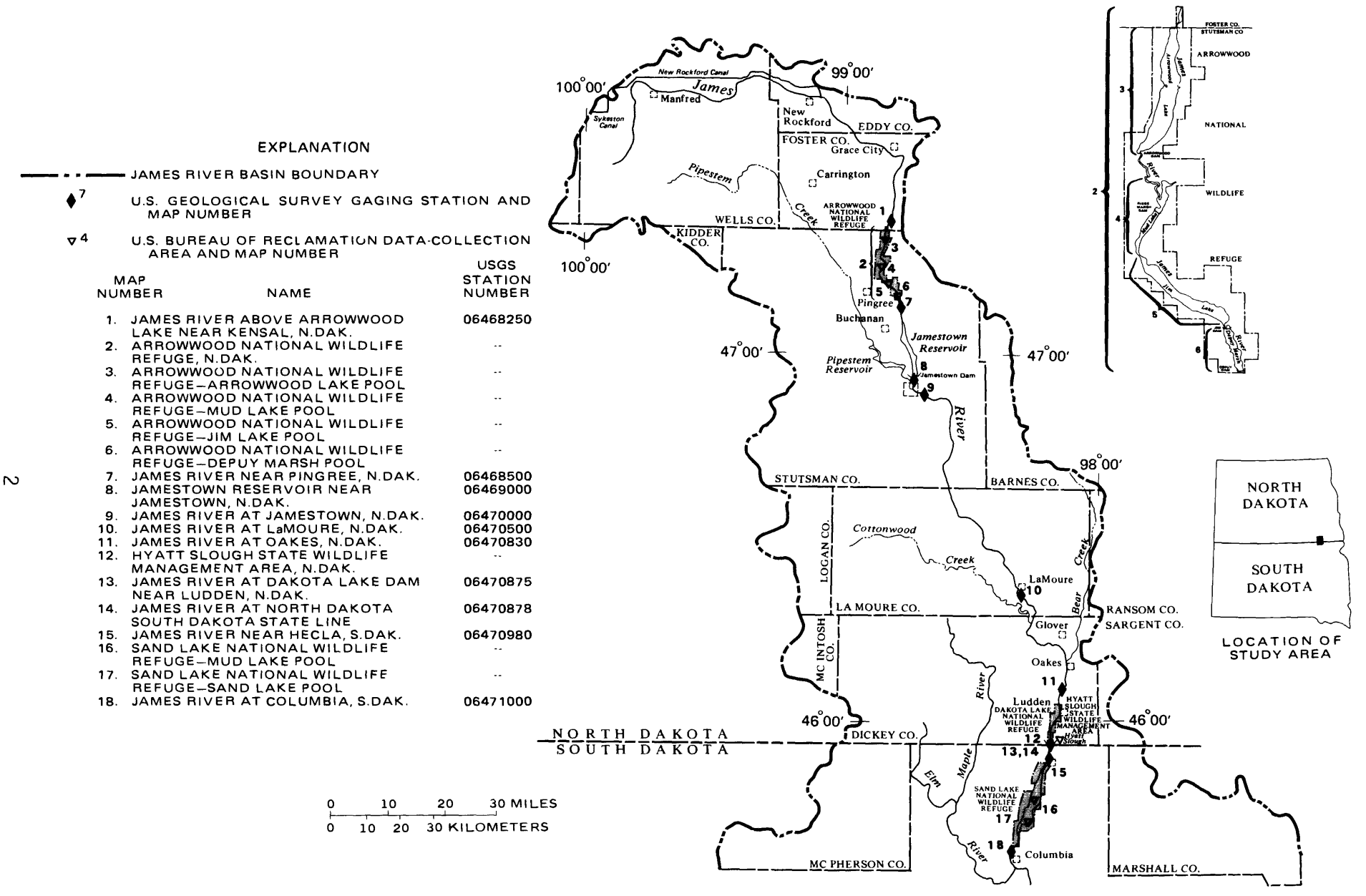


**Figure 1.–Central part of James River basin, location of U.S.Geological Survey gaging stations, and location of U.S.Bureau of Reclamation data-collection areas.**

Field measurements of discharge, water temperature, and specific conductance at the time of sample collection are listed in this report. For gaging stations 06468250, 06470000, 06470500 and 06470875 (Kensal, Jamestown, LaMoure, and Ludden), daily records for discharge are available also. Daily records for water temperature and specific conductance are available for gaging stations 06470500, 06470830, 06470875, and 06471000 (LaMoure, Oakes, Ludden, and Columbia), and daily records of gage height and velocity are available for gaging station 06470980 (Hecla). All of these daily values are stored in the computer files of the U.S. Geological Survey. Values for selected characteristics and constituents for water years 1979-87 have been published annually in U.S. Geological Survey, Water Resources Data for North Dakota reports (1979-87) and U.S. Geological Survey, Water Resources Data for South Dakota reports (1979-87).

The primary purpose of this report is to summarize available water-quality data collected during 1979-87 for selected locations in the central part of the James River basin. The objectives of the report are: (1) To compile statistical summaries of available data by location and by water-quality characteristic and constituent; (2) to compare values for selected characteristics and constituents to State water-quality standards; (3) to note, where possible, seasonal trends in selected characteristics and constituents; and (4) to note the adequacy of available data for determining baseline (pre-Unit) conditions in the study area.

## STATE WATER-QUALITY STANDARDS AND STATISTICAL SUMMARIES OF DATA

Water quality in the James River is regulated by State statutes. In North Dakota, the James River is a Class IA stream. Water quality in this class permits the propagation of resident fish species and is suitable for municipal use, water recreation, irrigation, stock watering, and wildlife use (North Dakota State Department of Health, 1985). In South Dakota, water quality in the James River falls into two beneficial-use categories: (1) Warmwater semipermanent fish life propagation waters and (2) limited contact recreation waters (South Dakota Department of Water and Natural Resources, Board of Water Management, 1987). The water-quality standards for North Dakota and South Dakota that were used in this report are shown in table 1. The water-quality data in tables 2-20 were compared to these standards and the number of measurements exceeding each standard is shown. Data for gaging station 06470878 at the North Dakota-South Dakota State line were compared to the standards for both States (tables 15-16).

Statistical summaries of data collected during this study for selected locations in the James River basin are shown in tables 2-20. Data for the gaging stations (tables 2, 8-12, 14-17 and 20) were collected by the U.S. Geological Survey; data for the refuge areas (tables 3-7, 13, 18 and 19) were collected by the U.S. Bureau of Reclamation. To facilitate comparison of nearby locations, tables 2-20 are presented in downstream order, beginning with gaging station 06468250 upstream from the Arrowwood National Wildlife Refuge near Kensal, N.Dak., and ending with gaging station 06471000 downstream from the Sand Lake National Wildlife Refuge at

Columbia, S.Dak. Because a large amount of data is available for the Arrowwood National Wildlife Refuge, data for all of the 48 sites in the refuge are summarized first as a whole (table 3), and then for each of the four pools (tables 4-7; fig. 1).

The frequency of collection and the suite of water-quality characteristics and constituents varies from location to location, depending on the objectives established by the U.S. Geological Survey and the U.S. Bureau of Reclamation. Data collected by the U.S. Geological Survey at the gaging stations were intended to provide a periodic synopsis of a large number of water-quality characteristics and constituents. During 1979-87, an average of eight samples per station per year was collected at intervals of 1 to 2 months; however, for stations 06470878 and 06470980 (State line and Hecla), the record is discontinuous for intervals of 32 to 56 months. Data collected by the U.S. Bureau of Reclamation in the wildlife refuges were intended to provide a more intensive examination of a smaller number of water-quality characteristics and constituents during four consecutive summers, from 1984-87. These data generally were collected at monthly intervals.

Some of the total number of measurements shown in tables 2-20 are preceded by an asterisk (*). The asterisk indicates that the total number of measurements includes analyses that were reported as "less than a detection limit." These analyses are valid indications that a water sample was analyzed for a particular constituent and its concentration was found to be less than a detectable amount; however, these analyses were not included in the calculation of the mean and standard deviation shown for the constituent.

Some of the maximum values shown in tables 2-20 are preceded by a symbol meaning "is less than" (<). This symbol indicates that all analyses for a particular constituent are less than a detection limit and, therefore, no descriptive statistics were calculated. Of the 71 pesticide constituents measured for the Kensal, Ludden, and Columbia gaging stations (06468250, 06470875, and 06471000) 69 are shown in this manner (tables 2, 14, and 20). During the study period, methods of analysis improved and the data base contains some water-quality constituents that have more than one detection limit. If all analyses for a particular constituent were reported as less than the prevailing detection limit, the largest limit, preceded by the symbol <, is the maximum value shown in tables 2-20.

Some samples were analyzed for both dissolved and total concentrations of a constituent, while others were analyzed for either the dissolved or total concentration of a constituent. Generally, more samples were analyzed for the dissolved concentration than for the total concentration. North Dakota standards for Class IA streams specify whether the statutory limit applies to the total concentration in a sample or to the dissolved concentration. For most trace elements there is no State standard for the dissolved concentration of a constituent, but for some of the trace elements listed in this report, the dissolved concentration exceeds the State

standard for the total concentration. When no State standard exists for the dissolved concentration of a trace element, the symbol PE is used in tables 2-20 in the "Number of measurements exceeding the North Dakota standard" column to indicate that some of the dissolved concentrations exceeded the State standard for the total concentration.

## SEASONAL TRENDS IN WATER-QUALITY CHARACTERISTICS AND CONSTITUENTS

As previously noted, the U.S. Geological Survey and the U.S. Bureau of Reclamation established different frequencies for collecting water-quality data in the study area. The difference is important because it severely limits comparison of seasonal trends between the two sets of data. For many characteristics and constituents, there are too few data to calculate reliable seasonal trends; therefore, only a few general patterns can be determined.

At most gaging stations, water-quality data were collected periodically during 1979-87. All months of the year are represented, but there are too few samples to justify the calculation of monthly means. Gaging-station data generally are sufficient for division into three annual seasons: (1) the spring-runoff season, March through May; (2) the summer-growth season, June through September; and (3) the cold-water season, October through February. Variability in many water-quality characteristics and constituents is greatest during the spring-runoff season, when a large amount of runoff from snowmelt occurs.

Seasonal means of selected water-quality characteristics and constituents for the 10 James River main-stem gaging stations in the study area are shown in table 21. Seasonal variability in characteristics and constituents can be seen by comparing the mean values. Differences between seasonal means are more pronounced at some stations, but general patterns are apparent for some characteristics and constituents.

For most major constituents (tables 2-20), mean concentrations are lowest during the spring-runoff season and increase thereafter. The discharge of the river probably controls the seasonal mean concentrations of many major constituents.

Another pattern is seen in mean water temperature, which reaches a maximum during the summer-growth season and then decreases through the rest of the year. Mean dissolved oxygen has an opposite pattern: its seasonal mean reaches a minimum during the summer season and increases thereafter. Seasonal variations in the mean concentration of dissolved oxygen probably reflect the fact that the solubility of oxygen decreases as water temperature increases.

Insufficient data are available for most of the nutrients and trace elements to calculate reliable seasonal means for more than one season. Therefore, seasonal trends were not determined for these constituents.

In the wildlife refuges, water-quality data were collected at monthly intervals during four consecutive summer seasons (1984-87). Because only half of the year is represented, if these data are divided into three annual seasons, there is a disproportionate number of samples for the summer season and too few samples for either of the other two seasons to calculate reliable seasonal means. Too few samples are available to justify the calculation of monthly means during the summer season, but there are enough samples to calculate bimonthly means. Although not directly comparable with seasonal means for the gaging stations, bimonthly means for the refuge areas indicate the variation in water-quality characteristics and constituents as the growing season progresses.

Bimonthly means of selected water-quality characteristics and constituents for samples collected during the summer season in the wildlife refuges are shown in table 22. The same information for different pools within the Arrowwood National Wildlife Refuge is shown in table 23. Overall patterns of bimonthly means for refuge areas are quite similar to patterns observed in seasonal means for gaging stations. Although some of the means for the Hyatt Slough State Wildlife Management Area are exceptional, bimonthly means of characteristics and constituents for samples collected in refuge areas (tables 22-23) generally are in the same range and change in the same direction as summer-season means for samples collected at the gaging-stations (table 21). The very large values for some characteristics and constituents in Hyatt Slough reflect the fact that this shallow pond is connected to the river only during times of peak flow. During the summer months, evaporation probably controls the concentrations of many water-quality constituents in Hyatt Slough.

## ADEQUACY OF DATA BASE FOR DEFINING BASELINE WATER-QUALITY CONDITIONS

The amount of data collected during this study varies widely by characteristic and constituent and ranges from 1 measurement of total acidity and total fluoride to more than 1,500 measurements of water temperature and specific conductance. For the seven categories shown in tables 2-20, the most measurements generally are for physical properties and major constituents followed by chlorophyll data, nutrients, trace elements, pesticides, and sediment data.

The number of measurements of water-quality characteristics and constituents exceeding detection limits is shown in table 24. Data for some physical properties, major constituents, chlorophyll, and a few of the nutrients are sufficient to estimate reliable means for the period of collection, but data for most of the other characteristics and constituents are not. Limited data for a few trace elements are available for selected locations, but these data represent isolated samples that may reflect only rough estimates of trace-element concentrations.

The North Dakota water-quality standard for total cyanide in Class IA streams is 0.005 milligrams per liter. The exact number of measurements exceeding this standard could not be determined because the detection limit

for total cyanide was 0.010 milligrams per liter. However, five measurements of total cyanide for gaging station 06468500 (Pingree) exceeded the detection limit and, therefore, exceeded the North Dakota standard. Seven measurements of dissolved cyanide (no standard) had concentrations ranging from 0.01 to 0.02 milligrams per liter, which indicates also that total cyanide concentrations might, at times, exceed the North Dakota standard. The South Dakota water-quality standard for total cyanide is 0.020 milligrams per liter. The measurements of total cyanide at gaging stations 06470980 and 06471000 (Hecla and Columbia) do not exceed the South Dakota standard.

Very few data for pesticides are available. Of the 71 pesticides, only 2 exceeded detection limits. At stations 06470875 and 06471000 (Ludden and Columbia), two commonly used pesticides, atrazine and 2,4-D (2,4-dichlorophenoxy acetic acid), exceeded their detection limits; however, there are no State water-quality standards for comparison.

Data on 15 sediment characteristics are available for the LaMoure gaging station (06470500), but only 3 of these characteristics were measured elsewhere in the study area. There are no State water-quality standards for sediment characteristics.

A large amount of water-quality data was collected in the central part of the James River basin during 1979-87; however, only some of the 190 characteristics and constituents have enough measurements at any given location to determine reliable mean values for the study period. Data for many characteristics and constituents represent isolated samples. For most characteristics and constituents, the available data are too few to calculate seasonal trends, and only very general seasonal patterns can be determined.

## REFERENCES CITED

North Dakota State Department of Health, 1985, Standards of water quality for State of North Dakota: North Dakota Century Code, chapter 33-16-02.

South Dakota Department of Water and Natural Resources, Board of Water Management, 1987, Surface water quality standards: Administrative Rules for South Dakota, chapter 74:03:02.

U.S. Geological Survey, 1979-80, Water resources data for North Dakota, water years 1979-80--volume 1: U.S. Geological Survey Water-Data Reports ND-79-1 to ND-80-1 (published annually).

U.S. Geological Survey, 1981, Water resources data for North Dakota, water year 1981--volume 2: U.S. Geological Survey Water-Data Report ND-81-2.

U.S. Geological Survey, 1982-87, Water resources data for North Dakota, water years 1982-87--volume 1: U.S. Geological Survey Water-Data Reports ND-82-1 to ND-87-1 (published annually).

U.S. Geological Survey, 1979-87, Water resources data for South Dakota, water years 1979-87--volume 1: U.S. Geological Survey Water-Data Reports SD-79-1 to SD-87-1 (published annually).



page 10 follows

Table 1.--Selected State water-quality standards for the James River in North Dakota and South Dakota

[°C, degrees Celsius; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; pCi/L, picocuries per liter; colonies/100 ml, colonies per 100 milliliters; -- indicates no value]

| Water-quality characteristic or constituent | North Dakota Class IA streams | South Dakota warmwater semipermanent fish life propagation waters | South Dakota limited contact recreation waters |
|---|---|---|---|
| **Physical properties** | | | |
| pH (units) | 7.0 - 8.5 | 6.5 - 9.0 | 6.0 - 9.0 |
| Temperature, water (°C) | 29.44 | 32.22 | -- |
| Oxygen, dissolved (mg/L) | NLT 5.0 | NLT 5.0 | NLT 5.0 |
| Suspended solids (mg/L) | -- | 90 | -- |
| **Major constituents** | | | |
| Sodium, percent of total cations (meq/L) | NGT 60 | -- | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 450 | -- | -- |
| Chloride, dissolved (mg/L as Cl) | 175 | -- | -- |
| **Nutrients** | | | |
| Nitrate, dissolved (mg/L as N) | 1.0 | -- | -- |
| Ammonia, un-ionized (mg/L as N) | .02 | .04 | -- |
| Phosphorus, dissolved (mg/L as P) | .10 | -- | -- |
| **Trace elements** | | | |
| Arsenic, total (µg/L as As) | 50 | -- | -- |
| Barium, dissolved (µg/L as Ba) | 1,000 | -- | -- |
| Boron, dissolved (µg/L as B) | 750 | -- | -- |
| Cadmium, total (µg/L as Cd) | 10 | -- | -- |
| Chlorine, total residual (µg/L) | 200 | 20 | -- |

Table 1.--Selected State water-quality standards for the James River in North Dakota and South Dakota--Continued

| Water-quality characteristic or constituent | North Dakota Class IA streams | South Dakota warmwater semipermanent fish life propagation waters | South Dakota limited contact recreation waters |
|---|---|---|---|
| | Trace elements--Continued | | |
| Chromium, total (µg/L as Cr) | 50 | -- | -- |
| Copper, total (µg/L as Cu) | 50 | -- | -- |
| Cyanide, total (mg/L as CN) | .005 | .02 | -- |
| Cyanide, free (mg/L as CN) | -- | .005 | -- |
| Hydrogen sulfide (mg/L) | -- | .002 | -- |
| Lead, dissolved (µg/L as Pb) | 50 | -- | -- |
| Mercury, total recoverable (µg/L as Hg) | 2 | -- | -- |
| Selenium, total (µg/L as Se) | 10 | -- | -- |
| Zinc, total (µg/L as Zn) | 1,000 | -- | -- |
| | Radionuclides | | |
| Radium 226 and radium 228, combined (pCi/L) | 5 | 5 | -- |
| Alpha, gross, total (pCi/L) | 15 | -- | -- |
| | Pesticides | | |
| PCB, total (ug/L) | .15 | .001 | -- |
| Phenols, total (mg/L) | .01 | -- | -- |
| | Bacteria | | |
| Coliform, fecal (colonies/100 ml) | 200 | -- | 1,000 |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; <, less than; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 1,180.00 | 0.30 | 122.94 | 311.59 | -- | 19 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 1,720.00 | 260.00 | 868.60 | 372.08 | -- | 20 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,770.00 | 653.00 | 998.67 | 330.78 | -- | 15 | -- |
| pH, field (units) | 8.94 | 7.58 | 8.13 | .43 | 7.0 - 8.5 | 16 | 2 |
| pH, laboratory (units) | 8.80 | 7.30 | 7.95 | .36 | 7.0 - 8.5 | 15 | 1 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 23.00 | 0 | 9.95 | 8.84 | 29.44 | 21 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 15.00 | 2.30 | 8.23 | 4.57 | -- | 15 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 12.80 | 2.30 | 7.53 | 3.18 | NLT 5 | 15 | 3 |
| Oxygen, dissolved, percent saturation (percent) | 119.00 | 20.00 | 68.87 | 28.95 | -- | 15 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 5.50 | 5.50 | 5.50 | -- | -- | 1 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 550.00 | 180.00 | 310.67 | 105.39 | -- | 15 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 510.00 | 0 | 56.52 | 143.51 | -- | 21 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,140.00 | 415.00 | 652.67 | 217.46 | -- | 15 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,200.00 | 393.00 | 580.40 | 196.00 | -- | 15 | -- |
| Dissolved solids, tons per acre-foot | 1.55 | .56 | .89 | .30 | -- | 15 | -- |
| Dissolved solids, tons per day | 177.00 | 0 | 19.58 | 45.10 | -- | 15 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 41.00 | 2.00 | 17.87 | 12.13 | -- | 15 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 99.00 | 24.00 | 55.20 | 20.97 | -- | 15 | -- |
| Magnesium, dissolved (mg/L as Mg) | 74.00 | 27.00 | 42.20 | 13.40 | -- | 15 | -- |
| Sodium, dissolved (mg/L as Na) | 210.00 | 52.00 | 101.93 | 46.19 | -- | 15 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 50.00 | 30.00 | 39.53 | 5.94 | NGT 60 | 15 | 0 |
| Sodium-adsorption ratio (SAR) | 4.00 | 2.00 | 2.53 | .74 | -- | 15 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 231.00 | 65.00 | 116.80 | 47.99 | -- | 15 | -- |
| Potassium, dissolved (mg/L as K) | 21.00 | 10.00 | 14.87 | 2.83 | -- | 15 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 642.00 | 217.00 | 379.20 | 162.22 | -- | 5 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 567.00 | 210.00 | 324.00 | 93.10 | -- | 12 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | -- | -- | -- | -- | -- | 0 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 350.00 | 110.00 | 164.67 | 68.23 | 450 | 15 | 0 |
| Chloride, dissolved (mg/L as Cl) | 59.00 | 13.00 | 24.93 | 14.46 | 175 | 15 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 45.00 | 13.00 | 25.42 | 10.09 | -- | 12 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.07 | 0.07 | 0.07 | -- | 1 | 1 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, total (mg/L as N) | .03 | .02 | .02 | 0.01 | -- | *6 | -- |
| Nitrite, dissolved (mg/L as N) | .05 | .01 | .02 | .02 | -- | *15 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .16 | .03 | .08 | .06 | -- | 4 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .40 | .40 | .40 | -- | -- | *6 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .12 | .12 | .12 | -- | -- | *15 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .04 | .02 | .03 | .01 | -- | 3 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .05 | .03 | .04 | .01 | -- | 3 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .00 | .00 | .00 | -- | .02 | 1 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .41 | .09 | .20 | .12 | -- | 5 | -- |
| Phosphorus, dissolved (mg/L as P) | .20 | .02 | .09 | .06 | .10 | 15 | 3 |
| Phosphate, ortho, total (mg/L as P) | 2.50 | .02 | .49 | .98 | -- | 6 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .16 | .01 | .07 | .06 | -- | *14 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | .49 | .02 | .23 | .17 | -- | 12 | PE |
| Carbon, organic, total (mg/L as C) | 23.00 | 23.00 | 23.00 | -- | -- | 1 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, total (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Arsenic, total (µg/L as As) | 7.00 | 2.00 | 3.40 | 2.19 | 50 | 5 | 0 |
| Arsenic, dissolved (µg/L as As) | 9.00 | 2.00 | 3.62 | 2.26 | -- | 13 | -- |
| Barium, total (µg/L as Ba) | 100.00 | 100.00 | 100.00 | 0 | -- | *5 | -- |
| Barium, dissolved (µg/L as Ba) | 130.00 | 46.00 | 82.30 | 25.20 | 1,000 | 10 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 5 | -- |
| Beryllium, dissolved (µg/L as Be) | 1.00 | .60 | .80 | .28 | -- | *10 | -- |
| Boron, total (µg/L as B) | 200.00 | 10.00 | 107.50 | 77.62 | -- | 4 | -- |
| Boron, dissolved (µg/L as B) | 290.00 | 90.00 | 194.67 | 54.62 | 750 | 15 | 0 |
| Cadmium, total (µg/L as Cd) | <1.00 | -- | -- | -- | 10 | 5 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 1.00 | 1.00 | 1.00 | 0 | -- | *13 | -- |
| Chromium, total (µg/L as Cr) | 5.00 | 5.00 | 5.00 | -- | 50 | 1 | 0 |
| Chromium, dissolved (µg/L as Cr) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 9 | -- |
| Copper, dissolved (µg/L as Cu) | 3.00 | 1.00 | 2.00 | .76 | -- | *15 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .005 | 6 | NC |
| Cyanide, dissolved (mg/L as CN) | <.01 | -- | -- | -- | -- | 11 | -- |
| Iron, total (µg/L as Fe) | 680.00 | 680.00 | 680.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 55.00 | 9.00 | 22.07 | 13.99 | -- | 15 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 2.00 | 1.00 | 1.33 | .58 | 50 | *15 | 0 |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | -- | -- | -- | -- | -- | 0 | -- |
| Manganese, dissolved (µg/L as Mn) | 1,300.00 | 4.00 | 216.73 | 337.90 | -- | 15 | -- |
| Mercury, dissolved (µg/L as Hg) | .70 | .10 | .31 | .15 | -- | 14 | -- |
| Molybdenum, dissolved (µg/L as Mo) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, total (µg/L as Ni) | 8.00 | 2.00 | 5.00 | 3.00 | -- | *4 | -- |
| Nickel, dissolved (µg/L as Ni) | 3.00 | 1.00 | 2.14 | .69 | -- | *9 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | 10 | 4 | 0 |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 15 | -- |
| Silver, total (µg/L as Ag) | 1.00 | 1.00 | 1.00 | -- | -- | *4 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Strontium, dissolved (µg/L as Sr) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 3 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | 10.00 | 3.00 | 6.92 | 2.31 | -- | *15 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | <.10 | -- | -- | -- | .15 | 7 | 0 |
| PCB, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Alachlor, total, recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Aldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Aldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | <0.10 | -- | -- | -- | -- | 7 | -- |
| Atrazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Chlordane, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Chlordane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Cyanazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| DDD, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDD, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDE, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDE, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDT, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDT, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DEF, total (µg/L) | <.01 | -- | -- | -- | -- | 1 | -- |
| Diazinon, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Diazinon, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Dieldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Dieldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Disyston, total (µg/L) | <.01 | -- | -- | -- | -- | 2 | -- |
| Endosulfan, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Endosulfan, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Endrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Endrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Ethion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Ethion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| Guthion, total (µg/L) | <0.10 | -- | -- | -- | -- | 6 | -- |
| Heptachlor, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Heptachlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Heptachlor epoxide, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Heptachlor epoxide, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Lindane, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Lindane, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Malathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Malathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methomyl, total (µg/L) | <2.00 | -- | -- | -- | -- | 5 | -- |
| Methoxychlor, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methoxychlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methyl parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methyl trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methyl trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Mirex, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Mirex, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| PCN, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | <0.10 | -- | -- | -- | -- | 6 | -- |
| Parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Perthane, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Perthane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Phorate, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Prometone, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Prometryne, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Propazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Propham, total (µg/L) | <2.00 | -- | -- | -- | -- | 4 | -- |
| Sevin, total (µg/L) | <2.00 | -- | -- | -- | -- | 5 | -- |
| Silvex, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Simazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Simetryne, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Toxaphene, total (µg/L) | <1.00 | -- | -- | -- | -- | 7 | -- |
| Toxaphene, dissolved (µg/L) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Trifluralin, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 4 | -- |
| Trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| 2,4-D, total (µg/L) | .10 | 0.02 | 0.05 | 0.03 | -- | *6 | -- |
| 2,4-DP, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| 2,4,5-T, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 15.00 | 15.00 | 15.00 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 1.90 | 1.90 | 1.90 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 2.--Summary of water-quality data for station 06468250, James River above Arrowwood Lake near Kensal, North Dakota, June 26, 1985, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 53.00 | 89.40 | 13.36 | -- | 15 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 122.00 | 4.00 | 39.94 | 36.76 | -- | 16 | -- |
| Sediment discharge, tons per day | 21.00 | .01 | 2.42 | 5.32 | -- | 16 | -- |

Table 3.--Summary of water-quality data for Arrowwood National Wildlife Refuge, North Dakota, June 25, 1984, to August 20, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 1,700.00 | 260.00 | 772.30 | 143.95 | -- | 400 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,260.00 | 340.00 | 767.99 | 137.09 | -- | 403 | -- |
| pH, field (units) | 9.87 | 5.90 | 8.31 | .43 | 7.0 - 8.5 | 400 | 114 |
| pH, laboratory (units) | 8.81 | 6.60 | 8.14 | .38 | 7.0 - 8.5 | 37 | 6 |
| Oxidation reduction potential (mV) | .34 | .01 | .15 | .04 | -- | 376 | -- |
| Temperature, water (°C) | 28.90 | 10.70 | 19.59 | 3.60 | 29.44 | 390 | 0 |
| Turbidity (NTU) | 470.00 | 1.00 | 61.09 | 59.32 | -- | 257 | -- |
| Turbidity, at mid-depth (NTU) | 76.00 | 7.00 | 29.14 | 18.28 | -- | 36 | -- |
| Transparency, secchi disk (in.) | 2.37 | .08 | .44 | .38 | -- | 345 | -- |
| Oxygen, dissolved (mg/L) | 16.24 | 1.66 | 8.14 | 2.22 | NLT 5 | 400 | 31 |
| Dissolved solids, sum of constituents (mg/L) | 780.53 | 182.00 | 465.52 | 86.17 | -- | 403 | -- |
| Suspended solids, inorganic (mg/L) | 628.00 | .75 | 34.83 | 58.66 | -- | 300 | -- |
| Suspended solids, organic (mg/L) | 130.67 | 0 | 16.51 | 15.32 | -- | 300 | -- |

Table 3.--Summary of water-quality data for Arrowwood National Wildlife Refuge, North Dakota, June 25, 1984, to August 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 69.30 | 23.10 | 41.49 | 8.88 | -- | 403 | -- |
| Magnesium, dissolved (mg/L as Mg) | 53.90 | 13.20 | 33.60 | 5.86 | -- | 403 | -- |
| Sodium, dissolved (mg/L as Na) | 149.60 | 17.60 | 73.04 | 21.00 | -- | 403 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 50.34 | 22.33 | 37.12 | 6.20 | NGT 60 | 403 | 0 |
| Sodium-adsorption ratio (SAR) | 3.57 | .69 | 2.04 | .54 | -- | 403 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 169.29 | 26.40 | 89.09 | 22.93 | -- | 403 | -- |
| Potassium, dissolved (mg/L as K) | 22.00 | 8.36 | 16.05 | 2.48 | -- | 403 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 514.11 | 29.93 | 304.69 | 67.29 | -- | 403 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 120.60 | 0 | 9.51 | 16.18 | -- | 403 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 723.00 | 232.00 | 424.60 | 120.38 | -- | 47 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 230.98 | 39.85 | 128.13 | 36.03 | 450 | 403 | 0 |
| Chloride, dissolved (mg/L as Cl) | 26.00 | 4.25 | 13.12 | 3.53 | 175 | 403 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 2.07 | 0 | .03 | .14 | 1 | 408 | 2 |
| Nitrite, dissolved (mg/L as N) | .10 | 0 | .01 | .02 | -- | 417 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.37 | 0 | .34 | .29 | -- | 403 | -- |

Table 3.--Summary of water-quality data for Arrowwood National Wildlife Refuge, North Dakota, June 25, 1984, to August 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 47 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 8.64 | .31 | 2.41 | 1.23 | -- | 417 | -- |
| Phosphorus, total (mg/L as P) | 1.14 | 0 | .26 | .17 | -- | 417 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .48 | 0 | .10 | .10 | .10 | 417 | 132 |
| Carbon, organic, total (mg/L as C) | 29.00 | 7.95 | 15.14 | 4.97 | -- | 48 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 8.00 | 1.10 | 3.72 | 1.71 | -- | *50 | -- |
| Cadmium, dissolved (µg/L as Cd) | .43 | .21 | .29 | .06 | -- | *50 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 50 | -- |
| Lead, dissolved (µg/L as Pb) | 5.10 | 1.00 | 2.55 | 1.12 | 50 | *50 | 0 |
| Mercury, dissolved (µg/L as Hg) | .23 | .23 | .23 | -- | -- | *50 | -- |
| Selenium, dissolved (µg/L as Se) | 1.40 | 1.00 | 1.22 | .18 | -- | *50 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 50 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 334.32 | .50 | 63.05 | 59.55 | -- | 178 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 49.17 | 0 | 1.82 | 5.33 | -- | 178 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 26.66 | 0 | 4.21 | 4.94 | -- | 178 | -- |

Table 4.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Arrowwood Lake pool, North Dakota, June 25, 1984, to August 18, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 990.00 | 290.00 | 743.73 | 135.92 | -- | 102 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 980.00 | 390.00 | 736.31 | 133.50 | -- | 103 | -- |
| pH, field (units) | 9.87 | 5.90 | 8.49 | .53 | 7.0 - 8.5 | 102 | 41 |
| pH, laboratory (units) | 8.53 | 7.60 | 8.22 | .29 | 7.0 - 8.5 | 12 | 2 |
| Oxidation reduction potential (mV) | .27 | .01 | .13 | .05 | -- | 96 | -- |
| Temperature, water (°C) | 24.30 | 10.70 | 19.16 | 3.26 | 29.44 | 102 | 0 |
| Turbidity (NTU) | 260.00 | 2.00 | 66.61 | 53.61 | -- | 64 | -- |
| Turbidity, at mid-depth (NTU) | 76.00 | 12.00 | 40.92 | 23.04 | -- | 12 | -- |
| Transparency, secchi disk (in.) | 1.55 | .12 | .48 | .37 | -- | 85 | -- |
| Oxygen, dissolved (mg/L) | 16.24 | 1.66 | 7.90 | 2.26 | NLT 5 | 102 | 10 |
| Dissolved solids, sum of constituents (mg/L) | 597.99 | 219.75 | 451.87 | 82.77 | -- | 103 | -- |
| Suspended solids, inorganic (mg/L) | 140.00 | .75 | 27.14 | 24.52 | -- | 77 | -- |
| Suspended solids, organic (mg/L) | 78.67 | 0 | 15.44 | 14.27 | -- | 77 | -- |

Table 4.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Arrowwood Lake pool, North Dakota, June 25, 1984, to August 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 61.60 | 23.10 | 36.66 | 8.25 | -- | 103 | -- |
| Magnesium, dissolved (mg/L as Mg) | 45.10 | 16.50 | 32.97 | 5.79 | -- | 103 | -- |
| Sodium, dissolved (mg/L as Na) | 105.60 | 23.10 | 72.41 | 19.94 | -- | 103 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 50.34 | 23.64 | 38.32 | 6.74 | NGT 60 | 103 | 0 |
| Sodium-adsorption ratio (SAR) | 3.19 | .82 | 2.09 | .56 | -- | 103 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 120.89 | 31.90 | 88.29 | 22.16 | -- | 103 | -- |
| Potassium, dissolved (mg/L as K) | 20.02 | 8.80 | 15.88 | 2.68 | -- | 103 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 413.04 | 29.93 | 262.95 | 71.46 | -- | 103 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 120.60 | 0 | 19.46 | 25.79 | -- | 103 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 678.00 | 274.00 | 445.00 | 117.96 | -- | 16 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 195.95 | 46.21 | 131.21 | 39.67 | 450 | 103 | 0 |
| Chloride, dissolved (mg/L as Cl) | 23.44 | 5.77 | 13.23 | 3.19 | 175 | 103 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | .26 | 0 | .03 | .05 | 1 | 103 | 0 |
| Nitrite, dissolved (mg/L as N) | .10 | 0 | .01 | .03 | -- | 105 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.37 | .03 | .36 | .34 | -- | 103 | -- |

Table 4.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Arrowwood Lake pool, North Dakota, June 25, 1984, to August 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 16 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 5.62 | .44 | 2.61 | 1.22 | -- | 105 | -- |
| Phosphorus, total (mg/L as P) | .78 | .01 | .26 | .17 | -- | 105 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .45 | 0 | .11 | .11 | .10 | 105 | 36 |
| Carbon, organic, total (mg/L as C) | 25.00 | 7.95 | 15.81 | 4.88 | -- | 16 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 6.90 | 1.10 | 4.50 | 1.67 | -- | *17 | -- |
| Cadmium, dissolved (µg/L as Cd) | .35 | .21 | .29 | .06 | -- | *17 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 17 | -- |
| Lead, dissolved (µg/L as Pb) | 5.00 | 1.00 | 2.47 | 1.33 | 50 | *17 | 0 |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 17 | -- |
| Selenium, dissolved (µg/L as Se) | 1.40 | 1.20 | 1.30 | .14 | -- | *17 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 17 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 334.32 | .66 | 86.54 | 79.48 | -- | 48 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 6.13 | 0 | .51 | 1.13 | -- | 48 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 13.73 | 0 | 4.99 | 4.55 | -- | 48 | -- |

Table 5.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Mud Lake pool, North Dakota, June 25, 1984, to August 18, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 1,700.00 | 260.00 | 809.28 | 170.74 | -- | 125 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,260.00 | 340.00 | 801.61 | 154.25 | -- | 124 | -- |
| pH, field (units) | 8.88 | 7.29 | 8.23 | .28 | 7.0 - 8.5 | 125 | 19 |
| pH, laboratory (units) | 8.30 | 7.76 | 8.01 | .18 | 7.0 - 8.5 | 13 | 0 |
| Oxidation reduction potential (mV) | .20 | .04 | .15 | .03 | -- | 113 | -- |
| Temperature, water (°C) | 25.40 | 11.50 | 19.35 | 3.66 | 29.44 | 121 | 0 |
| Turbidity (NTU) | 470.00 | 1.00 | 61.69 | 67.32 | -- | 80 | -- |
| Turbidity, at mid-depth (NTU) | 28.00 | 7.00 | 18.92 | 6.07 | -- | 12 | -- |
| Transparency, secchi disk (in.) | 1.48 | .15 | .41 | .29 | -- | 105 | -- |
| Oxygen, dissolved (mg/L) | 15.03 | 2.80 | 8.15 | 1.98 | NLT 5 | 125 | 4 |
| Dissolved solids, sum of constituents (mg/L) | 780.53 | 191.81 | 484.61 | 98.59 | -- | 124 | -- |
| Suspended solids, inorganic (mg/L) | 274.70 | 1.00 | 31.07 | 43.22 | -- | 93 | -- |
| Suspended solids, organic (mg/L) | 64.00 | 0 | 17.30 | 14.72 | -- | 93 | -- |

Table 5.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Mud Lake pool, North Dakota, June 25, 1984, to August 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 68.20 | 25.30 | 45.23 | 7.21 | -- | 124 | -- |
| Magnesium, dissolved (mg/L as Mg) | 53.90 | 15.40 | 34.79 | 6.43 | -- | 124 | -- |
| Sodium, dissolved (mg/L as Na) | 149.60 | 20.90 | 77.19 | 23.86 | -- | 124 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 48.78 | 24.23 | 37.03 | 5.66 | NGT 60 | 124 | 0 |
| Sodium-adsorption ratio (SAR) | 3.57 | .81 | 2.08 | .55 | -- | 124 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 169.29 | 29.37 | 93.03 | 26.05 | -- | 124 | -- |
| Potassium, dissolved (mg/L as K) | 22.00 | 8.36 | 15.84 | 2.69 | -- | 124 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 514.11 | 151.51 | 344.48 | 59.63 | -- | 124 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 43.00 | 0 | 4.81 | 6.53 | -- | 124 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 723.00 | 249.00 | 449.19 | 136.53 | -- | 16 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 230.98 | 39.85 | 123.19 | 37.61 | 450 | 124 | 0 |
| Chloride, dissolved (mg/L as Cl) | 26.00 | 4.82 | 13.45 | 4.09 | 175 | 124 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 2.07 | 0 | .03 | .20 | 1 | 126 | 1 |
| Nitrite, dissolved (mg/L as N) | .05 | 0 | .01 | .01 | -- | 132 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.06 | .01 | .26 | .21 | -- | 124 | -- |

Table 5.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Mud Lake pool, North Dakota, June 25, 1984, to August 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 16 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 6.40 | .31 | 2.39 | 1.18 | -- | 132 | -- |
| Phosphorus, total (mg/L as P) | .70 | 0 | .29 | .16 | -- | 132 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .37 | 0 | .12 | .10 | .10 | 132 | 59 |
| Carbon, organic, total (mg/L as C) | 29.00 | 11.00 | 15.06 | 5.27 | -- | 16 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 8.00 | 1.40 | 3.51 | 2.01 | -- | 16 | -- |
| Cadmium, dissolved (µg/L as Cd) | .43 | .26 | .32 | .07 | -- | *16 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 16 | -- |
| Lead, dissolved (µg/L as Pb) | 5.10 | 1.30 | 3.07 | 1.32 | 50 | *16 | 0 |
| Mercury, dissolved (µg/L as Hg) | .23 | .23 | .23 | -- | -- | *16 | -- |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 16 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 16 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 131.98 | 1.46 | 42.01 | 26.92 | -- | 56 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 11.08 | 0 | 1.97 | 2.63 | -- | 56 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 23.90 | 0 | 3.63 | 4.71 | -- | 56 | -- |

Table 6.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Jim Lake pool, North Dakota, July 17, 1984, to August 19, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 940.00 | 320.00 | 762.34 | 69.70 | -- | 111 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 950.00 | 350.00 | 760.70 | 71.87 | -- | 114 | -- |
| pH, field (units) | 8.82 | 7.32 | 8.29 | .33 | 7.0 - 8.5 | 111 | 33 |
| pH, laboratory (units) | 8.47 | 6.60 | 7.77 | 1.02 | 7.0 - 8.5 | 3 | 1 |
| Oxidation reduction potential (mV) | .21 | .07 | .15 | .03 | -- | 111 | -- |
| Temperature, water (°C) | 25.60 | 11.50 | 19.87 | 3.54 | 29.44 | 109 | 0 |
| Turbidity (NTU) | 390.00 | 3.00 | 64.46 | 61.72 | -- | 80 | -- |
| Turbidity, at mid-depth (NTU) | 42.00 | 8.50 | 25.83 | 16.78 | -- | 3 | -- |
| Transparency, secchi disk (in.) | 2.37 | .08 | .43 | .49 | -- | 106 | -- |
| Oxygen, dissolved (mg/L) | 15.90 | 3.36 | 8.37 | 2.45 | NLT 5 | 111 | 12 |
| Dissolved solids, sum of constituents (mg/L) | 569.10 | 189.73 | 459.32 | 44.34 | -- | 114 | -- |
| Suspended solids, inorganic (mg/L) | 628.00 | 1.60 | 46.74 | 90.29 | -- | 84 | -- |
| Suspended solids, organic (mg/L) | 130.67 | 0 | 17.37 | 16.92 | -- | 84 | -- |

Table 6.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Jim Lake pool, North Dakota, July 17, 1984, to August 19, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 58.30 | 26.40 | 41.36 | 8.90 | -- | 114 | -- |
| Magnesium, dissolved (mg/L as Mg) | 39.60 | 15.40 | 32.82 | 2.96 | -- | 114 | -- |
| Sodium, dissolved (mg/L as Na) | 100.10 | 19.80 | 69.54 | 14.12 | -- | 114 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 44.92 | 23.50 | 36.61 | 5.78 | NGT 60 | 114 | 0 |
| Sodium-adsorption ratio (SAR) | 2.67 | .76 | 1.97 | .45 | -- | 114 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 117.92 | 28.38 | 86.29 | 15.59 | -- | 114 | -- |
| Potassium, dissolved (mg/L as K) | 19.36 | 8.58 | 16.75 | 1.70 | -- | 114 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 392.90 | 136.46 | 296.78 | 30.70 | -- | 114 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 18.40 | 0 | 5.80 | 5.58 | -- | 114 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 477.00 | 233.00 | 380.25 | 104.56 | -- | 4 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 167.75 | 40.91 | 133.38 | 23.02 | 450 | 114 | 0 |
| Chloride, dissolved (mg/L as Cl) | 19.05 | 4.25 | 12.92 | 2.79 | 175 | 114 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 1.53 | 0 | .04 | .15 | 1 | 113 | 1 |
| Nitrite, dissolved (mg/L as N) | .08 | 0 | .02 | .02 | -- | 114 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.34 | 0 | .46 | .31 | -- | 114 | -- |

Table 6.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Jim Lake pool, North Dakota, July 17, 1984, to August 19, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.02 | 0.00 | 0.01 | 0.01 | 0.02 | 4 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 8.64 | .45 | 2.46 | 1.30 | -- | 114 | -- |
| Phosphorus, total (mg/L as P) | 1.14 | .02 | .21 | .15 | -- | 114 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .23 | 0 | .05 | .04 | .10 | 114 | 14 |
| Carbon, organic, total (mg/L as C) | 18.00 | 10.00 | 13.25 | 3.95 | -- | 4 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 4.80 | 2.00 | 3.13 | 1.47 | -- | *4 | -- |
| Cadmium, dissolved (µg/L as Cd) | .29 | .29 | .29 | -- | -- | *4 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 4 | -- |
| Lead, dissolved (µg/L as Pb) | 2.50 | 1.10 | 1.93 | .74 | 50 | *4 | 0 |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 4 | -- |
| Selenium, dissolved (µg/L as Se) | 1.10 | 1.10 | 1.10 | -- | -- | *4 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 4 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 291.46 | 2.45 | 55.18 | 48.20 | -- | 44 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 30.17 | 0 | 1.65 | 4.55 | -- | 44 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 16.68 | 0 | 2.98 | 3.68 | -- | 44 | -- |

Table 7.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Depuy Marsh pool, North Dakota, June 25, 1984 to August 20, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 1,090.00 | 290.00 | 735.41 | 213.22 | -- | 37 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,080.00 | 340.00 | 740.54 | 210.01 | -- | 37 | -- |
| pH, field (units) | 8.65 | 6.58 | 7.94 | .52 | 7.0 - 8.5 | 37 | 8 |
| pH, laboratory (units) | 8.81 | 7.98 | 8.36 | .31 | 7.0 - 8.5 | 9 | 3 |
| Oxidation reduction potential (mV) | .21 | .07 | .15 | .03 | -- | 32 | -- |
| Temperature, water (°C) | 28.90 | 11.50 | 20.81 | 4.19 | 29.44 | 35 | 0 |
| Turbidity (NTU) | 150.00 | 2.00 | 33.06 | 37.86 | -- | 17 | -- |
| Turbidity, at mid-depth (NTU) | 61.00 | 14.50 | 28.17 | 15.54 | -- | 9 | -- |
| Transparency, secchi disk (in.) | 1.42 | .15 | .51 | .37 | -- | 25 | -- |
| Oxygen, dissolved (mg/L) | 11.80 | 2.61 | 7.89 | 2.38 | NLT 5 | 37 | 4 |
| Dissolved solids, sum of constituents (mg/L) | 671.39 | 182.00 | 439.16 | 132.12 | -- | 37 | -- |
| Suspended solids, inorganic (mg/L) | 259.40 | 2.20 | 33.33 | 57.76 | -- | 31 | -- |
| Suspended solids, organic (mg/L) | 63.60 | 0 | 15.87 | 16.29 | -- | 31 | -- |

Table 7.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Depuy Marsh pool, North Dakota, June 25, 1984 to August 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 69.30 | 24.20 | 44.56 | 8.89 | -- | 37 | -- |
| Magnesium, dissolved (mg/L as Mg) | 51.70 | 13.20 | 32.55 | 9.59 | -- | 37 | -- |
| Sodium, dissolved (mg/L as Na) | 117.70 | 17.60 | 64.87 | 28.66 | -- | 37 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 43.85 | 22.33 | 33.27 | 6.55 | NGT 60 | 37 | 0 |
| Sodium-adsorption ratio (SAR) | 2.89 | .69 | 1.76 | .65 | -- | 37 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 137.17 | 26.40 | 79.75 | 31.02 | -- | 37 | -- |
| Potassium, dissolved (mg/L as K) | 19.47 | 8.80 | 14.88 | 2.84 | -- | 37 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 498.04 | 136.46 | 317.66 | 82.38 | -- | 37 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 28.32 | 0 | 3.65 | 6.63 | -- | 37 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 488.00 | 232.00 | 357.27 | 97.22 | -- | 11 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 182.83 | 39.85 | 110.21 | 43.76 | 450 | 37 | 0 |
| Chloride, dissolved (mg/L as Cl) | 24.11 | 4.30 | 11.58 | 4.36 | 175 | 37 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | .11 | 0 | .02 | .03 | 1 | 40 | 0 |
| Nitrite, dissolved (mg/L as N) | .09 | 0 | 0 | .01 | -- | 40 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .97 | .02 | .24 | .22 | -- | 37 | -- |

Table 7.--Summary of water-quality data for Arrowwood National Wildlife Refuge, Depuy Marsh pool, North Dakota, June 25, 1984 to August 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 11 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 3.78 | .39 | 1.66 | .91 | -- | 40 | -- |
| Phosphorus, total (mg/L as P) | .77 | .03 | .21 | .18 | -- | 40 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .42 | 0 | .10 | .10 | .10 | 40 | 13 |
| Carbon, organic, total (mg/L as C) | 26.00 | 9.50 | 15.00 | 5.36 | -- | 12 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 5.00 | 1.80 | 3.20 | 1.05 | -- | *13 | -- |
| Cadmium, dissolved (µg/L as Cd) | .26 | .25 | .26 | .01 | -- | *13 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 13 | -- |
| Lead, dissolved (µg/L as Pb) | 2.60 | 1.90 | 2.36 | .26 | 50 | *13 | 0 |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 13 | -- |
| Selenium, dissolved (µg/L as Se) | 1.40 | 1.00 | 1.20 | .28 | -- | *13 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 13 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 217.87 | 1.50 | 78.64 | 65.45 | -- | 22 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 49.17 | 0 | 5.01 | 12.63 | -- | 22 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 26.66 | 0 | 6.96 | 7.42 | -- | 22 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota,

January 4, 1979, to November 18, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; *, mean and standard deviation computed from fewer measurements; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; <, less than; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 770.00 | 1.50 | 117.50 | 287.89 | -- | 7 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 1,410.00 | 295.00 | 680.10 | 184.82 | -- | 48 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,210.00 | 347.00 | 690.82 | 165.96 | -- | 39 | -- |
| pH, field (units) | 9.10 | 7.40 | 8.38 | .45 | 7.0 - 8.5 | 48 | 20 |
| pH, laboratory (units) | 8.80 | 7.70 | 8.09 | .30 | 7.0 - 8.5 | 39 | 3 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 25.00 | 0 | 10.79 | 8.10 | 29.44 | 49 | 0 |
| Color (platinum-cobalt units) | 200.00 | 5.00 | 39.52 | 34.61 | -- | 44 | -- |
| Turbidity (NTU) | 100.00 | 1.20 | 16.90 | 24.13 | -- | 17 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 22.40 | 3.10 | 10.26 | 4.03 | NLT 5 | 34 | 3 |
| Oxygen, dissolved, percent saturation (percent) | 169.00 | 44.00 | 94.26 | 31.18 | -- | 31 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 6.50 | 6.50 | 6.50 | -- | -- | 1 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 580.00 | 99.00 | 225.30 | 76.76 | -- | 47 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 230.00 | 0 | 9.10 | 34.15 | -- | 49 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,130.00 | 191.00 | 445.77 | 145.86 | -- | 47 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,010.00 | 178.00 | 417.51 | 133.50 | -- | 47 | -- |
| Dissolved solids, tons per acre-foot | 1.54 | .26 | .61 | .20 | -- | 47 | -- |
| Dissolved solids, tons per day | 909.00 | 0 | 30.12 | 146.95 | -- | 47 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 332.00 | 1.00 | 42.81 | 80.63 | -- | *17 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 110.00 | 18.00 | 40.23 | 15.14 | -- | 47 | -- |
| Magnesium, dissolved (mg/L as Mg) | 73.00 | 12.00 | 30.30 | 10.13 | -- | 47 | -- |
| Sodium, dissolved (mg/L as Na) | 140.00 | 23.00 | 57.87 | 21.36 | -- | 47 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 42.00 | 24.00 | 33.67 | 5.05 | NGT 60 | 47 | 0 |
| Sodium-adsorption ratio (SAR) | 3.00 | .90 | 1.70 | .52 | -- | 47 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 175.00 | 29.40 | 72.92 | 24.60 | -- | 47 | -- |
| Potassium, dissolved (mg/L as K) | 35.00 | 6.40 | 15.04 | 4.28 | -- | 47 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Major constituents--Continued | | | | |
| Potassium 40, dissolved (pCi/L) | 13.00 | 12.00 | 12.50 | 0.71 | -- | 2 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 620.00 | 95.00 | 253.12 | 159.08 | -- | 8 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 335.00 | 227.00 | 277.75 | 47.31 | -- | 4 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 364.00 | 116.00 | 234.64 | 52.75 | -- | 39 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | -- | -- | -- | -- | -- | 0 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 190.00 | 39.00 | 111.30 | 38.19 | 450 | 47 | 0 |
| Chloride, dissolved (mg/L as Cl) | 54.00 | 5.80 | 12.77 | 7.19 | 175 | 47 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .30 | .10 | .17 | .06 | -- | *45 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 30.00 | .08 | 10.06 | 8.10 | -- | *44 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.51 | 0.51 | 0.51 | -- | 1 | 1 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, total (mg/L as N) | .04 | .01 | .02 | 0.02 | -- | *6 | -- |
| Nitrite, dissolved (mg/L as N) | .03 | .01 | .02 | .01 | -- | *17 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .10 | .03 | .08 | .03 | -- | 4 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .60 | .60 | .60 | -- | -- | *6 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .54 | 0 | .15 | .17 | -- | *46 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .03 | .01 | .02 | .01 | -- | 3 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .04 | .01 | .03 | .02 | -- | 3 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | -- | -- | -- | -- | .02 | 0 | -- |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .33 | .13 | .22 | .08 | -- | 6 | -- |
| Phosphorus, dissolved (mg/L as P) | .50 | 0 | .07 | .09 | .10 | 46 | 8 |
| Phosphate, ortho, total (mg/L as P) | .18 | .02 | .09 | .06 | -- | 6 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .17 | 0 | .04 | .05 | -- | 13 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | .52 | 0 | .13 | .15 | -- | 13 | PE |
| Carbon, organic, total (mg/L as C) | 20.00 | 20.00 | 20.00 | -- | -- | 1 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | 40.00 | 0.00 | 13.59 | 13.14 | -- | *21 | -- |
| Antimony, total (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Arsenic, total (µg/L as As) | 8.00 | 1.00 | 3.33 | 2.94 | 50 | 6 | 0 |
| Arsenic, dissolved (µg/L as As) | 6.00 | 1.00 | 2.73 | 1.39 | -- | *31 | -- |
| Barium, total (µg/L as Ba) | 100.00 | 100.00 | 100.00 | 0 | -- | *5 | -- |
| Barium, dissolved (µg/L as Ba) | 200.00 | 30.00 | 80.54 | 38.64 | 1,000 | *28 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 4 | -- |
| Beryllium, dissolved (µg/L as Be) | 1.00 | 1.00 | 1.00 | -- | -- | *10 | -- |
| Boron, total (µg/L as B) | 100.00 | 30.00 | 65.00 | 31.09 | -- | 4 | -- |
| Boron, dissolved (µg/L as B) | 300.00 | 50.00 | 123.91 | 41.55 | 750 | 46 | 0 |
| Cadmium, total (µg/L as Cd) | 1.00 | 1.00 | 1.00 | -- | 10 | *5 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 2.00 | 1.00 | 1.75 | .50 | -- | *31 | -- |
| Chromium, total (µg/L as Cr) | -- | -- | -- | -- | 50 | 0 | -- |
| Chromium, dissolved (µg/L as Cr) | 10.00 | 0 | 1.22 | 3.31 | -- | 26 | -- |
| Cobalt, dissolved (µg/L as Co) | 4.00 | 0 | 1.67 | 2.08 | -- | *28 | -- |
| Copper, dissolved (µg/L as Cu) | 4.00 | 0 | 1.57 | 1.16 | -- | *33 | -- |
| Cyanide, total (mg/L as CN) | .01 | 0 | 0 | .01 | .005 | *24 | NC |
| Cyanide, dissolved (mg/L as CN) | .02 | .01 | .01 | .01 | -- | *11 | -- |
| Iron, total (µg/L as Fe) | 850.00 | 850.00 | 850.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 350.00 | 4.00 | 40.92 | 76.75 | -- | *34 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 5.00 | 0 | 1.60 | 1.76 | 50 | *32 | 0 |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | 90.00 | 20.00 | 42.53 | 16.66 | -- | *20 | -- |
| Manganese, dissolved (µg/L as Mn) | 5,500.00 | 4.00 | 348.29 | 963.69 | -- | 34 | -- |
| Mercury, dissolved (µg/L as Hg) | 4.10 | 0 | .35 | .77 | -- | *32 | -- |
| Molybdenum, dissolved (µg/L as Mo) | 15.00 | 1.00 | 4.62 | 5.21 | -- | *21 | -- |
| Nickel, total (µg/L as Ni) | 3.00 | 1.00 | 2.25 | .96 | -- | 4 | -- |
| Nickel, dissolved (µg/L as Ni) | 7.00 | 0 | 2.86 | 1.73 | -- | *26 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | 10 | 6 | 0 |
| Selenium, dissolved (µg/L as Se) | 1.00 | 0 | .30 | .48 | -- | *34 | -- |
| Silver, total (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Strontium, dissolved (µg/L as Sr) | 850.00 | 90.00 | 276.00 | 167.38 | -- | 20 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 3 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Vanadium, dissolved (µg/L as V) | 4.00 | 0 | 1.67 | 1.59 | -- | *18 | -- |
| Zinc, dissolved (µg/L as Zn) | 20.00 | 3.00 | 8.74 | 4.52 | -- | *34 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 87.00 | 87.00 | 87.00 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 2.40 | 2.40 | 2.40 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 8.--Summary of water-quality data for station 06468500, James River near Pingree, North Dakota, January 4, 1979, to November 18, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Sediment data--Continued | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 40.00 | 87.58 | 18.52 | -- | 12 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 102.00 | 2.00 | 35.40 | 33.22 | -- | 15 | -- |
| Sediment discharge, tons per day | 12.00 | 0 | 1.68 | 3.42 | -- | 15 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; *, mean and standard deviation computed from fewer measurements; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; NC, not calculated; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; µg/L, micrograms per liter; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 867.00 | 405.00 | 588.48 | 83.54 | -- | 250 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 787.00 | 488.00 | 626.29 | 79.74 | -- | 28 | -- |
| pH, field (units) | 9.00 | 4.80 | 8.17 | .63 | 7.0 - 8.5 | 242 | 60 |
| pH, laboratory (units) | 8.70 | 7.80 | 8.30 | .20 | 7.0 - 8.5 | 28 | 2 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 25.50 | .50 | 11.18 | 7.70 | 29.44 | 262 | 0 |
| Color (platinum-cobalt units) | 60.00 | 5.00 | 24.29 | 12.58 | -- | *35 | -- |
| Turbidity (NTU) | -- | -- | -- | -- | -- | 0 | -- |
| Transparency, secchi disk (in.) | 188.00 | 2.60 | 68.97 | 53.49 | -- | 31 | -- |
| Oxygen, dissolved (mg/L) | 18.00 | .90 | 8.97 | 3.19 | NLT 5 | 252 | 20 |
| Oxygen, dissolved, percent saturation (percent) | 170.00 | 0 | 76.12 | 29.30 | -- | 128 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 260.00 | 130.00 | 201.14 | 30.08 | -- | 35 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 260.00 | 0 | 2.03 | 21.79 | -- | 263 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 514.00 | 236.00 | 377.42 | 61.10 | -- | 36 | -- |
| Dissolved solids, sum of constituents (mg/L) | 478.00 | 223.00 | 359.26 | 58.65 | -- | 35 | -- |
| Dissolved solids, tons per acre-foot | .70 | .32 | .51 | .08 | -- | 36 | -- |
| Dissolved solids, tons per day | NC | 0 | 0 | 0 | -- | 35 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 51.00 | 27.00 | 40.49 | 5.68 | -- | 35 | -- |
| Magnesium, dissolved (mg/L as Mg) | 33.00 | 15.00 | 24.43 | 4.19 | -- | 35 | -- |
| Sodium, dissolved (mg/L as Na) | 68.00 | 28.00 | 47.31 | 10.76 | -- | 35 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 36.00 | 26.00 | 31.71 | 2.52 | NGT 60 | 35 | 0 |
| Sodium-adsorption ratio (SAR) | 2.00 | 1.00 | 1.54 | .51 | -- | 35 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 83.00 | 37.10 | 60.87 | 12.16 | -- | 35 | -- |
| Potassium, dissolved (mg/L as K) | 19.00 | 8.80 | 13.56 | 2.57 | -- | 35 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Major constituents--Continued | | | | |
| Potassium 40, dissolved (pCi/L) | 9.00 | 9.00 | 9.00 | 0.00 | -- | 2 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | 230.00 | 230.00 | 230.00 | -- | -- | 1 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 230.00 | 130.00 | 178.00 | 30.84 | -- | 9 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 269.00 | 269.00 | 269.00 | -- | -- | 1 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 280.00 | 176.00 | 220.69 | 25.91 | -- | 26 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | 2.30 | 1.40 | 1.85 | .64 | -- | 2 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 140.00 | 53.00 | 92.75 | 21.60 | 450 | 36 | 0 |
| Chloride, dissolved (mg/L as Cl) | 19.00 | 7.00 | 10.85 | 2.69 | 175 | 36 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .90 | .10 | .20 | .13 | -- | 36 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 20.00 | 1.10 | 11.19 | 5.43 | -- | 35 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | -- | -- | -- | -- | 1 | 0 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite plus nitrate, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | 0.73 | 0.00 | 0.27 | 0.20 | -- | *35 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .37 | .37 | .37 | -- | -- | 1 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .48 | .48 | .48 | -- | -- | 1 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .01 | .01 | .01 | -- | .02 | 1 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, dissolved (mg/L as P) | .18 | .01 | .10 | .04 | .10 | 34 | 16 |
| Phosphate, ortho, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbon, organic, total (mg/L as C) | -- | -- | -- | -- | -- | 0 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | 10.00 | 10.00 | 10.00 | -- | -- | 1 | -- |
| Antimony, total (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, dissolved (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Arsenic, total (µg/L as As) | -- | -- | -- | -- | 50 | 0 | -- |
| Arsenic, dissolved (µg/L as As) | 2.00 | 2.00 | 2.00 | -- | -- | 1 | -- |
| Barium, total (µg/L as Ba) | -- | -- | -- | -- | -- | 0 | -- |
| Barium, dissolved (µg/L as Ba) | <100.00 | -- | -- | -- | 1,000 | 1 | 0 |
| Beryllium, total (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Beryllium, dissolved (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, total (µg/L as B) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, dissolved (µg/L as B) | 150.00 | 70.00 | 108.53 | 17.94 | 750 | *35 | 0 |
| Cadmium, total (µg/L as Cd) | -- | -- | -- | -- | 10 | 0 | -- |
| Cadmium, dissolved (µg/L as Cd) | -- | -- | -- | -- | -- | 1 | -- |
| Chromium, total (µg/L as Cr) | -- | -- | -- | -- | 50 | 0 | -- |
| Chromium, dissolved (µg/L as Cr) | -- | -- | -- | -- | -- | 1 | -- |
| Cobalt, dissolved (µg/L as Co) | 4.00 | 4.00 | 4.00 | -- | -- | 1 | -- |
| Copper, dissolved (µg/L as Cu) | -- | -- | -- | -- | -- | 1 | -- |
| Cyanide, total (mg/L as CN) | 0 | 0 | 0 | -- | .005 | 1 | NC |
| Cyanide, dissolved (mg/L as CN) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, total (µg/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, dissolved (µg/L as Fe) | 30.00 | 30.00 | 30.00 | -- | -- | 1 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | -- | -- | -- | -- | 50 | 1 | 0 |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | 20.00 | 20.00 | 20.00 | -- | -- | 1 | -- |
| Manganese, dissolved (µg/L as Mn) | 260.00 | 260.00 | 260.00 | -- | -- | 1 | -- |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 1 | -- |
| Molybdenum, dissolved (µg/L as Mo) | <1.00 | -- | -- | -- | -- | 1 | -- |
| Nickel, total (µg/L as Ni) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, dissolved (µg/L as Ni) | 2.00 | 2.00 | 2.00 | -- | -- | 1 | -- |
| Selenium, total (µg/L as Se) | -- | -- | -- | -- | 10 | 0 | -- |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 1 | -- |
| Silver, total (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Silver, dissolved (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Strontium, dissolved (µg/L as Sr) | 180.00 | 180.00 | 180.00 | -- | -- | 1 | -- |
| Thallium, total (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, dissolved (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 1 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 9.--Summary of water-quality data for station 06469000, Jamestown Reservoir near Jamestown, North Dakota, January 4, 1979, to October 20, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; <, less than; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 553.00 | 2.50 | 110.79 | 139.17 | -- | 86 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 1,320.00 | 185.00 | 729.12 | 260.34 | -- | 86 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,170.00 | 495.00 | 752.55 | 204.27 | -- | 23 | -- |
| pH, field (units) | 8.50 | 7.50 | 7.99 | .27 | 7.0 - 8.5 | 38 | 0 |
| pH, laboratory (units) | 8.80 | 7.30 | 7.99 | .33 | 7.0 - 8.5 | 30 | 2 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 25.00 | 0 | 8.44 | 8.18 | 29.44 | 86 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 20.00 | 2.80 | 8.94 | 5.30 | -- | 24 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 15.40 | 5.60 | 10.22 | 2.74 | NLT 5 | 22 | 0 |
| Oxygen, dissolved, percent saturation (percent) | 122.00 | 39.00 | 87.77 | 21.44 | -- | 22 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 2.90 | 2.90 | 2.90 | -- | -- | 1 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 440.00 | 130.00 | 258.21 | 84.72 | -- | 39 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 420.00 | 0 | 23.58 | 63.76 | -- | 86 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | <0.10 | -- | -- | -- | -- | 1 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 802.00 | 228.00 | 465.42 | 153.59 | -- | 38 | -- |
| Dissolved solids, sum of constituents (mg/L) | 837.00 | 199.00 | 452.87 | 160.91 | -- | 39 | -- |
| Dissolved solids, tons per acre-foot | 1.14 | .31 | .65 | .22 | -- | 39 | -- |
| Dissolved solids, tons per day | 447.00 | 4.15 | 87.57 | 99.59 | -- | 39 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 66.00 | 6.00 | 22.35 | 15.02 | -- | 23 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 110.00 | 29.00 | 58.23 | 22.12 | -- | 39 | -- |
| Magnesium, dissolved (mg/L as Mg) | 42.00 | 12.00 | 27.54 | 7.66 | -- | 39 | -- |
| Sodium, dissolved (mg/L as Na) | 110.00 | 15.00 | 59.15 | 25.80 | -- | 39 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 42.00 | 19.00 | 30.83 | 5.09 | NGT 60 | 39 | 0 |
| Sodium-adsorption ratio (SAR) | 2.00 | .60 | 1.52 | .53 | -- | 39 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 119.00 | 22.00 | 71.29 | 24.85 | -- | 39 | -- |
| Potassium, dissolved (mg/L as K) | 18.00 | 5.30 | 12.14 | 3.10 | -- | 39 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | 310.00 | 130.00 | 230.00 | 70.71 | -- | 5 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 460.00 | 150.00 | 267.27 | 94.88 | -- | 11 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | 13.00 | 0 | 2.60 | 5.81 | -- | 5 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 11.00 | 0 | 1.00 | 3.32 | -- | 11 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 251.00 | 104.00 | 190.00 | 61.35 | -- | 5 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 341.00 | 145.00 | 238.75 | 81.73 | -- | 4 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 418.00 | 130.00 | 238.22 | 70.59 | -- | 27 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | 15.00 | 1.50 | 5.51 | 4.30 | -- | 14 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 240.00 | 56.00 | 135.33 | 50.88 | 450 | 39 | 0 |
| Chloride, dissolved (mg/L as Cl) | 52.00 | 6.60 | 20.44 | 13.35 | 175 | 39 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .30 | .10 | .18 | .07 | -- | 15 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 30.00 | 4.30 | 13.54 | 6.02 | -- | 36 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.66 | 0.07 | 0.25 | 0.15 | 1 | 23 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | 2.90 | .71 | 1.27 | .70 | -- | 11 | -- |
| Nitrite, total (mg/L as N) | .05 | .01 | .03 | .01 | -- | 6 | -- |
| Nitrite, dissolved (mg/L as N) | .15 | .01 | .03 | .04 | -- | *24 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .49 | .03 | .12 | .12 | -- | 14 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .50 | .10 | .30 | .17 | -- | 6 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .54 | .11 | .26 | .12 | -- | *24 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .11 | .06 | .09 | .03 | -- | 3 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .14 | .08 | .12 | .03 | -- | 3 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | -- | -- | -- | -- | .02 | 0 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .28 | .11 | .20 | .08 | -- | 5 | -- |
| Phosphorus, dissolved (mg/L as P) | .20 | .02 | .08 | .05 | .10 | 24 | 5 |
| Phosphate, ortho, total (mg/L as P) | .19 | .05 | .12 | .05 | -- | 6 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .43 | .01 | .10 | .10 | -- | 16 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 1.30 | .04 | .31 | .28 | -- | 22 | PE |
| Carbon, organic, total (mg/L as C) | 12.00 | 12.00 | 12.00 | -- | -- | 1 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, total (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Arsenic, total (µg/L as As) | 4.00 | 2.00 | 3.00 | 0.82 | 50 | 4 | 0 |
| Arsenic, dissolved (µg/L as As) | 4.00 | 0 | 2.43 | .93 | -- | 21 | -- |
| Barium, total (µg/L as Ba) | 100.00 | 100.00 | 100.00 | 0 | -- | 5 | -- |
| Barium, dissolved (µg/L as Ba) | 92.00 | 42.00 | 64.33 | 16.58 | 1,000 | 12 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 5 | -- |
| Beryllium, dissolved (µg/L as Be) | <.50 | -- | -- | -- | -- | 12 | -- |
| Boron, total (µg/L as B) | 200.00 | 30.00 | 87.50 | 80.16 | -- | 4 | -- |
| Boron, dissolved (µg/L as B) | 550.00 | 0 | 192.82 | 133.06 | 750 | 39 | 0 |
| Cadmium, total (µg/L as Cd) | <1.00 | -- | -- | -- | 10 | 5 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 1.00 | 1.00 | 1.00 | -- | -- | *15 | -- |
| Chromium, total (µg/L as Cr) | 9.00 | 9.00 | 9.00 | -- | 50 | 1 | 0 |
| Chromium, dissolved (µg/L as Cr) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 11 | -- |
| Copper, dissolved (µg/L as Cu) | 7.00 | 1.00 | 2.20 | 1.47 | -- | *24 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .005 | 5 | NC |
| Cyanide, dissolved (mg/L as CN) | .01 | .01 | .01 | -- | -- | *13 | -- |
| Iron, total (µg/L as Fe) | 920.00 | 920.00 | 920.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 260.00 | 0 | 46.47 | 56.16 | -- | *39 | -- |
| Iron 59, dissolved (pCi/L as Fe) | 1.00 | 1.00 | 1.00 | 0 | -- | 2 | -- |
| Lead, dissolved (µg/L as Pb) | 5.00 | 0 | 1.33 | 1.72 | 50 | *30 | 0 |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | 39.00 | 20.00 | 27.00 | 7.64 | -- | 6 | -- |
| Manganese, dissolved (µg/L as Mn) | 1,800.00 | 20.00 | 603.62 | 480.43 | -- | 39 | -- |
| Mercury, dissolved (µg/L as Hg) | 5.00 | .10 | .58 | .95 | -- | *29 | PE |
| Molybdenum, dissolved (µg/L as Mo) | 4.00 | 0 | 2.00 | 1.83 | -- | 4 | -- |
| Nickel, total (µg/L as Ni) | 9.00 | 1.00 | 4.50 | 3.32 | -- | 4 | -- |
| Nickel, dissolved (µg/L as Ni) | 6.00 | 1.00 | 2.91 | 1.70 | -- | *12 | -- |
| Selenium, total (µg/L as Se) | 2.00 | 2.00 | 2.00 | -- | 10 | *5 | 0 |
| Selenium, dissolved (µg/L as Se) | 1.00 | 0 | .14 | .38 | -- | *30 | -- |
| Silver, total (µg/L as Ag) | 1.00 | 1.00 | 1.00 | -- | -- | *4 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Strontium, dissolved (µg/L as Sr) | 250.00 | 80.00 | 164.83 | 68.56 | -- | 6 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 2 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 8 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | 23.00 | 3.00 | 8.40 | 5.15 | -- | *24 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 8.50 | 8.50 | 8.50 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | .20 | .20 | .20 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 10.--Summary of water-quality data for station 06470000, James River at Jamestown, North Dakota, January 5, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 29.00 | 84.07 | 21.88 | -- | 14 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 65.00 | 8.00 | 35.42 | 15.32 | -- | 19 | -- |
| Sediment discharge, tons per day | 30.00 | .16 | 8.11 | 10.47 | -- | 19 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; *, mean and standard deviation computed from fewer measurements; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; <, less than; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 3,670.00 | 5.00 | 275.56 | 552.13 | -- | 100 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 1,600.00 | 200.00 | 779.33 | 310.12 | -- | 119 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,590.00 | 308.00 | 838.56 | 281.39 | -- | 55 | -- |
| pH, field (units) | 8.80 | 7.10 | 8.13 | .41 | 7.0 - 8.5 | 83 | 13 |
| pH, laboratory (units) | 8.50 | 7.40 | 8.03 | .24 | 7.0 - 8.5 | 56 | 0 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 26.50 | 0 | 11.06 | 8.99 | 29.44 | 118 | 0 |
| Color (platinum-cobalt units) | 160.00 | 4.00 | 33.23 | 29.69 | -- | *76 | -- |
| Turbidity (NTU) | 45.00 | 2.60 | 16.28 | 13.04 | -- | 20 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 21.00 | 2.00 | 10.04 | 4.10 | NLT 5 | 67 | 3 |
| Oxygen, dissolved, percent saturation (percent) | 145.00 | 36.00 | 91.45 | 21.69 | -- | 55 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 4.20 | 4.20 | 4.20 | -- | -- | 1 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 620.00 | 83.00 | 287.56 | 115.67 | -- | 75 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 320.00 | 0 | 19.45 | 39.08 | -- | 121 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,140.00 | 150.00 | 545.57 | 220.91 | -- | 75 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,070.00 | 136.00 | 528.83 | 217.72 | -- | 75 | -- |
| Dissolved solids, tons per acre-foot | 1.55 | .20 | .74 | .30 | -- | 75 | -- |
| Dissolved solids, tons per day | 1,490.00 | 0 | 161.82 | 216.69 | -- | 75 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 104.00 | 1.00 | 37.33 | 31.01 | -- | 21 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 160.00 | 20.00 | 66.03 | 28.98 | -- | 75 | -- |
| Magnesium, dissolved (mg/L as Mg) | 58.00 | 8.10 | 29.85 | 11.12 | -- | 75 | -- |
| Sodium, dissolved (mg/L as Na) | 260.00 | 9.70 | 72.78 | 41.58 | -- | 75 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 79.00 | 18.00 | 32.74 | 7.44 | NGT 60 | 75 | 1 |
| Sodium-adsorption ratio (SAR) | 10.00 | .50 | 1.87 | 1.19 | -- | 75 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 264.90 | 18.40 | 84.62 | 41.63 | -- | 75 | -- |
| Potassium, dissolved (mg/L as K) | 17.00 | 4.90 | 11.88 | 2.25 | -- | 77 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | 13.00 | 5.70 | 8.34 | 2.76 | -- | 5 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | 450.00 | 310.00 | 380.00 | 98.99 | -- | 2 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 540.00 | 540.00 | 540.00 | -- | -- | 1 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 0 | 0 | 0 | -- | -- | 1 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 530.00 | 60.00 | 256.17 | 129.82 | -- | 23 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 467.00 | 167.00 | 300.20 | 115.47 | -- | 5 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 500.00 | 91.00 | 265.84 | 85.25 | -- | 55 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | 14.00 | 1.00 | 6.90 | 6.58 | -- | 3 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 330.00 | 35.00 | 144.75 | 62.68 | 450 | 77 | 0 |
| Chloride, dissolved (mg/L as Cl) | 88.00 | 3.80 | 29.64 | 21.04 | 175 | 77 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .70 | 0 | .22 | .10 | -- | *76 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 44.00 | 2.70 | 13.86 | 8.28 | -- | 74 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at Lamoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.57 | 0.13 | 0.29 | 0.16 | 1 | 7 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | 1.00 | .62 | .81 | .27 | -- | 2 | -- |
| Nitrite, total (mg/L as N) | .07 | .01 | .03 | .03 | -- | *7 | -- |
| Nitrite, dissolved (mg/L as N) | .06 | .01 | .03 | .02 | -- | *21 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .20 | .03 | .09 | .07 | -- | 8 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .60 | .30 | .47 | .15 | -- | *8 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | 1.80 | 0 | .33 | .32 | -- | *75 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .28 | .21 | .25 | .05 | -- | *3 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .36 | .27 | .31 | .06 | -- | 2 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .03 | 0 | .01 | .02 | .02 | 2 | 1 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .37 | .13 | .27 | .09 | -- | 7 | -- |
| Phosphorus, dissolved (mg/L as P) | .87 | 0 | .14 | .14 | .10 | *75 | 39 |
| Phosphate, ortho, total (mg/L as P) | .19 | .07 | .15 | .05 | -- | 6 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .21 | .03 | .11 | .06 | -- | 15 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | .64 | .08 | .35 | .19 | -- | 14 | PE |
| Carbon, organic, total (mg/L as C) | 18.00 | 13.00 | 15.50 | 3.54 | -- | 2 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | 40.00 | 40.00 | 40.00 | -- | -- | 1 | -- |
| Antimony, total (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 11 | -- |
| Arsenic, total (µg/L as As) | 5.00 | 2.00 | 3.33 | 1.21 | 50 | 6 | 0 |
| Arsenic, dissolved (µg/L as As) | 5.00 | 1.00 | 2.60 | .99 | -- | 15 | -- |
| Barium, total (µg/L as Ba) | 200.00 | 100.00 | 116.67 | 40.82 | -- | 6 | -- |
| Barium, dissolved (µg/L as Ba) | 92.00 | 30.00 | 62.58 | 18.19 | 1,000 | 12 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 6 | -- |
| Beryllium, dissolved (µg/L as Be) | <.50 | -- | -- | -- | -- | 11 | -- |
| Boron, total (µg/L as B) | 1,200.00 | 60.00 | 354.00 | 479.25 | -- | 5 | -- |
| Boron, dissolved (µg/L as B) | 650.00 | 40.00 | 215.39 | 128.56 | 750 | 76 | 0 |
| Cadmium, total (µg/L as Cd) | 1.00 | 1.00 | 1.00 | -- | 10 | *7 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 2.00 | 0 | 1.00 | .71 | -- | *15 | -- |
| Chromium, total (µg/L as Cr) | 7.00 | 7.00 | 7.00 | -- | 50 | 1 | 0 |
| Chromium, dissolved (µg/L as Cr) | 1.00 | 1.00 | 1.00 | -- | -- | *14 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 11 | -- |
| Copper, dissolved (µg/L as Cu) | 7.00 | 1.00 | 1.94 | 1.47 | -- | *23 | -- |
| Cyanide, total (mg/L as CN) | <.01 | 0 | 0 | -- | .005 | 8 | NC |
| Cyanide, dissolved (mg/L as CN) | .02 | .02 | .02 | 0 | -- | *12 | -- |
| Iron, total (µg/L as Fe) | 1,300.00 | 30.00 | 665.00 | 898.03 | -- | 2 | -- |
| Iron, dissolved (µg/L as Fe) | 120.00 | 5.00 | 18.81 | 25.74 | -- | *22 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 4.00 | 1.00 | 2.50 | 1.29 | 50 | *22 | 0 |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | 5.00 | 5.00 | 5.00 | -- | -- | 1 | -- |
| Manganese, dissolved (µg/L as Mn) | 1,600.00 | 5.00 | 387.50 | 424.38 | -- | 22 | -- |
| Mercury, dissolved (µg/L as Hg) | .70 | .10 | .25 | .15 | -- | *23 | -- |
| Molybdenum, dissolved (µg/L as Mo) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Nickel, total (µg/L as Ni) | 9.00 | 2.00 | 5.33 | 2.80 | -- | 6 | -- |
| Nickel, dissolved (µg/L as Ni) | 4.00 | 1.00 | 2.56 | 1.01 | -- | *11 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | 10 | 6 | 0 |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 21 | -- |
| Silver, total (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 11 | -- |
| Strontium, dissolved (µg/L as Sr) | 70.00 | 70.00 | 70.00 | -- | -- | 1 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 3 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 7 | -- |
| Vanadium, dissolved (µg/L as V) | 2.00 | 2.00 | 2.00 | -- | -- | 1 | -- |
| Zinc, dissolved (µg/L as Zn) | 25.00 | 0 | 12.26 | 6.66 | -- | *22 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| recoverable (µg/L) | | | | | | | |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 44.00 | 44.00 | 44.00 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 1.40 | 1.40 | 1.40 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | 17.00 | 13.00 | 15.00 | 2.83 | -- | 2 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | 21.00 | 14.00 | 17.50 | 4.95 | -- | 2 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | 25.00 | 17.00 | 21.00 | 5.66 | -- | 2 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | 36.00 | 22.00 | 29.00 | 9.90 | -- | 2 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | 45.00 | 30.00 | 37.50 | 10.61 | -- | 2 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | 61.00 | 44.00 | 52.50 | 12.02 | -- | 2 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | 87.00 | 67.00 | 77.00 | 14.14 | -- | 2 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | 97.00 | 90.00 | 93.50 | 4.95 | -- | 2 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | 100.00 | 100.00 | 100.00 | 0 | -- | 2 | -- |

Table 11.--Summary of water-quality data for station 06470500, James River at LaMoure, North Dakota, January 4, 1979, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 14.00 | 81.07 | 30.90 | -- | 15 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | 59.00 | 59.00 | 59.00 | -- | -- | 1 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | 83.00 | 83.00 | 83.00 | -- | -- | 1 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | 100.00 | 100.00 | 100.00 | -- | -- | 1 | -- |
| Sediment, suspended concentration (mg/L) | 330.00 | 3.00 | 57.50 | 48.93 | -- | 56 | -- |
| Sediment discharge, tons per day | 3,270.00 | 0 | 81.89 | 434.96 | -- | 56 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; <, less than; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 1,800.00 | 5.00 | 355.75 | 481.59 | -- | 16 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 2,250.00 | 340.00 | 841.82 | 397.95 | -- | 44 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 2,290.00 | 421.00 | 908.53 | 435.54 | -- | 30 | -- |
| pH, field (units) | 9.00 | 7.50 | 8.25 | .36 | 7.0 - 8.5 | 35 | 8 |
| pH, laboratory (units) | 8.50 | 7.70 | 8.07 | .21 | 7.0 - 8.5 | 30 | 0 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 25.00 | 0 | 11.30 | 8.42 | 29.44 | 45 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 82.00 | 1.40 | 22.49 | 20.44 | -- | 18 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 24.40 | 5.60 | 11.73 | 4.92 | NLT 5 | 30 | 0 |
| Oxygen, dissolved, percent saturation (percent) | 167.00 | 67.00 | 100.96 | 23.62 | -- | 24 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 15.00 | 3.40 | 6.82 | 4.76 | -- | 5 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 750.00 | 150.00 | 320.67 | 159.78 | -- | 30 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 280.00 | 0 | 19.60 | 44.04 | -- | 55 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,560.00 | 261.00 | 598.56 | 333.56 | -- | 18 | -- |
| Dissolved solids, sum of constituents (mg/L) | 2,050.00 | 257.00 | 623.07 | 418.47 | -- | 30 | -- |
| Dissolved solids, tons per acre-foot | 2.79 | .35 | .86 | .56 | -- | 30 | -- |
| Dissolved solids, tons per day | 486.00 | 0 | 90.88 | 142.04 | -- | 30 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 278.00 | 3.00 | 55.34 | 52.83 | -- | 29 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 170.00 | 35.00 | 70.67 | 36.68 | -- | 30 | -- |
| Magnesium, dissolved (mg/L as Mg) | 82.00 | 16.00 | 35.10 | 16.78 | -- | 30 | -- |
| Sodium, dissolved (mg/L as Na) | 240.00 | 23.00 | 75.53 | 47.41 | -- | 30 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 40.00 | 23.00 | 31.47 | 3.79 | NGT 60 | 30 | 0 |
| Sodium-adsorption ratio (SAR) | 4.00 | .80 | 1.73 | .75 | -- | 30 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 258.00 | 36.00 | 89.53 | 48.95 | -- | 30 | -- |
| Potassium, dissolved (mg/L as K) | 23.00 | 10.00 | 14.00 | 2.61 | -- | 30 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 697.00 | 252.00 | 380.20 | 180.84 | -- | 5 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 697.00 | 135.00 | 296.62 | 137.77 | -- | 29 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | -- | -- | -- | -- | -- | 0 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 460.00 | 61.00 | 163.27 | 98.12 | 450 | 30 | 1 |
| Chloride, dissolved (mg/L as Cl) | 140.00 | 11.00 | 32.90 | 28.75 | 175 | 30 | 0 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .60 | .10 | .23 | .12 | -- | 30 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 990.00 | 1.50 | 64.26 | 201.75 | -- | 27 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.60 | 0.12 | 0.36 | 0.20 | 1 | 6 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | 1.70 | .62 | 1.16 | .76 | -- | 2 | -- |
| Nitrite, total (mg/L as N) | .05 | .02 | .03 | .02 | -- | *5 | -- |
| Nitrite, dissolved (mg/L as N) | .04 | .01 | .02 | .01 | -- | *30 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .13 | .03 | .08 | .04 | -- | 7 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .60 | .20 | .40 | .20 | -- | *5 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | 1.90 | .13 | .53 | .51 | -- | *30 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .61 | .01 | .10 | .12 | -- | 30 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .79 | .01 | .13 | .15 | -- | 30 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .02 | 0 | 0 | .01 | .02 | 25 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .33 | .12 | .25 | .10 | -- | 4 | -- |
| Phosphorus, dissolved (mg/L as P) | .21 | .01 | .09 | .05 | .10 | 29 | 11 |
| Phosphate, ortho, total (mg/L as P) | .21 | .09 | .15 | .05 | -- | 4 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .52 | .01 | .09 | .10 | -- | *30 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 1.60 | .03 | .28 | .30 | -- | 29 | PE |
| Carbon, organic, total (mg/L as C) | 11.00 | 11.00 | 11.00 | -- | -- | 1 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, total (µg/L as Sb) | 1.00 | 1.00 | 1.00 | -- | -- | *2 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Arsenic, total (µg/L as As) | 4.00 | 2.00 | 3.50 | 1.00 | 50 | 4 | 0 |
| Arsenic, dissolved (µg/L as As) | 5.00 | 2.00 | 3.00 | 1.08 | -- | 13 | -- |
| Barium, total (µg/L as Ba) | 100.00 | 100.00 | 100.00 | 0 | -- | *4 | -- |
| Barium, dissolved (µg/L as Ba) | 100.00 | 43.00 | 69.30 | 18.80 | 1,000 | 10 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 4 | -- |
| Beryllium, dissolved (µg/L as Be) | .50 | .50 | .50 | -- | -- | *10 | -- |
| Boron, total (µg/L as B) | 100.00 | 80.00 | 90.00 | 10.00 | -- | 3 | -- |
| Boron, dissolved (µg/L as B) | 720.00 | 60.00 | 206.00 | 146.42 | 750 | 30 | 0 |
| Cadmium, total (µg/L as Cd) | 1.00 | 1.00 | 1.00 | 0 | 10 | *5 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 3.00 | 3.00 | 3.00 | -- | -- | *13 | -- |
| Chromium, total (µg/L as Cr) | 10.00 | 10.00 | 10.00 | -- | 50 | 1 | 0 |
| Chromium, dissolved (µg/L as Cr) | 1.00 | 1.00 | 1.00 | -- | -- | *10 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 9 | -- |
| Copper, dissolved (µg/L as Cu) | 3.00 | 1.00 | 1.79 | .70 | -- | *18 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .005 | 5 | NC |
| Cyanide, dissolved (mg/L as CN) | .01 | .01 | .01 | -- | -- | *12 | -- |
| Iron, total (µg/L as Fe) | 1,500.00 | 1,500.00 | 1,500.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 130.00 | 4.00 | 18.90 | 24.06 | -- | *30 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 12.00 | 1.00 | 3.67 | 4.27 | 50 | *18 | 0 |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | -- | -- | -- | -- | -- | 0 | -- |
| Manganese, dissolved (µg/L as Mn) | 890.00 | 11.00 | 143.97 | 204.96 | -- | *30 | -- |
| Mercury, dissolved (µg/L as Hg) | .40 | .10 | .24 | .11 | -- | *16 | -- |
| Molybdenum, dissolved (µg/L as Mo) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, total (µg/L as Ni) | 9.00 | 4.00 | 5.75 | 2.36 | -- | 4 | -- |
| Nickel, dissolved (µg/L as Ni) | 5.00 | 2.00 | 3.25 | .89 | -- | *10 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | 10 | 4 | 0 |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 18 | -- |
| Silver, total (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Strontium, dissolved (µg/L as Sr) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 1 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | 21.00 | 5.00 | 12.86 | 4.38 | -- | *18 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides** | | | | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 22.00 | 22.00 | 22.00 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 1.70 | 1.70 | 1.70 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 12.--Summary of water-quality data for station 06470830, James River at Oakes, North Dakota, October 27, 1982, to November 17, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 99.00 | 28.00 | 79.33 | 24.88 | -- | 12 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 461.00 | 23.00 | 110.82 | 120.09 | -- | 11 | -- |
| Sediment discharge, tons per day | 124.00 | 0 | 37.45 | 43.52 | -- | 11 | -- |

Table 13.--Summary of water-quality data for Hyatt Slough State Wildlife Management Area, North Dakota, June 27, 1984, to July 6, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 1,790.00 | 950.00 | 1,360.00 | 212.36 | -- | 39 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,790.00 | 860.00 | 1,334.62 | 247.55 | -- | 39 | -- |
| pH, field (units) | 10.40 | 7.99 | 8.90 | .59 | 7.0 - 8.5 | 39 | 28 |
| pH, laboratory (units) | 9.07 | 8.00 | 8.60 | .46 | 7.0 - 8.5 | 6 | 4 |
| Oxidation reduction potential (mV) | .60 | .01 | .11 | .10 | -- | 39 | -- |
| Temperature, water (°C) | 27.80 | 6.40 | 19.67 | 5.87 | 29.44 | 39 | 0 |
| Turbidity (NTU) | 138.00 | 1.00 | 20.10 | 31.77 | -- | 21 | -- |
| Turbidity, at mid-depth (NTU) | 80.00 | 22.00 | 37.33 | 22.46 | -- | 6 | -- |
| Transparency, secchi disk (in.) | 1.47 | .20 | .99 | .29 | -- | 35 | -- |
| Oxygen, dissolved (mg/L) | 18.00 | 4.20 | 9.47 | 3.19 | NLT 5 | 39 | 2 |
| Dissolved solids, sum of constituents (mg/L) | 1,119.94 | 586.45 | 864.89 | 135.34 | -- | 39 | -- |
| Suspended solids, inorganic (mg/L) | 140.00 | .20 | 10.11 | 26.47 | -- | 28 | -- |
| Suspended solids, organic (mg/L) | 76.00 | 0 | 14.18 | 21.42 | -- | 30 | -- |

Table 13.--Summary of water-quality data for Hyatt Slough State Wildlife Management Area, North Dakota, June 27, 1984, to July 6, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 96.80 | 30.80 | 60.56 | 19.83 | -- | 39 | -- |
| Magnesium, dissolved (mg/L as Mg) | 81.40 | 41.80 | 61.68 | 10.23 | -- | 39 | -- |
| Sodium, dissolved (mg/L as Na) | 192.50 | 91.30 | 142.92 | 25.59 | -- | 39 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 47.35 | 34.37 | 40.20 | 3.66 | NGT 60 | 39 | 0 |
| Sodium-adsorption ratio (SAR) | 4.01 | 2.17 | 3.10 | .46 | -- | 39 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 248.60 | 123.53 | 188.34 | 31.46 | -- | 39 | -- |
| Potassium, dissolved (mg/L as K) | 56.10 | 32.23 | 45.43 | 6.07 | -- | 39 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 690.80 | 39.05 | 348.24 | 172.61 | -- | 39 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 163.00 | 0 | 64.01 | 48.94 | -- | 39 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 832.00 | 783.00 | 800.50 | 22.92 | -- | 4 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 293.40 | 189.70 | 231.77 | 24.99 | 450 | 39 | 0 |
| Chloride, dissolved (mg/L as Cl) | 122.48 | 55.45 | 85.85 | 17.03 | 175 | 39 | 0 |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | .16 | 0 | .02 | .04 | 1 | 39 | 0 |
| Nitrite, dissolved (mg/L as N) | .15 | 0 | .01 | .03 | -- | 39 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 3.25 | 0 | .51 | .76 | -- | 39 | -- |

Table 13.--Summary of water-quality data for Hyatt Slough State Wildlife Management Area, North Dakota, June 27, 1984, to July 6, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.07 | 0.00 | 0.03 | 0.03 | 0.02 | 4 | 2 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 8.32 | .02 | 2.85 | 1.72 | -- | 39 | -- |
| Phosphorus, total (mg/L as P) | 2.32 | .17 | .78 | .46 | -- | 39 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | 1.67 | .07 | .60 | .35 | .10 | 39 | 38 |
| Carbon, organic, total (mg/L as C) | -- | -- | -- | -- | -- | 0 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 7.50 | 5.30 | 6.20 | .94 | -- | 4 | -- |
| Cadmium, dissolved (µg/L as Cd) | .40 | .31 | .35 | .06 | -- | *4 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 4 | -- |
| Lead, dissolved (µg/L as Pb) | 2.90 | 2.40 | 2.65 | .35 | 50 | *4 | 0 |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 4 | -- |
| Selenium, dissolved (µg/L as Se) | 1.30 | 1.00 | 1.15 | .21 | -- | *4 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 4 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 294.44 | 0 | 37.80 | 82.01 | -- | 18 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 2.57 | 0 | .61 | .84 | -- | 18 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 16.15 | 0 | 3.19 | 5.27 | -- | 18 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; <, less than; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; *, mean and standard deviation computed from fewer measurements; µg/L, micrograms per liter; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 1,800.00 | 0.10 | 247.52 | 355.57 | -- | 52 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 2,300.00 | 315.00 | 803.29 | 314.79 | -- | 65 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 2,280.00 | 414.00 | 836.21 | 363.06 | -- | 38 | -- |
| pH, field (units) | 9.70 | 7.80 | 8.43 | .42 | 7.0 - 8.5 | 39 | 16 |
| pH, laboratory (units) | 8.70 | 7.50 | 8.16 | .27 | 7.0 - 8.5 | 39 | 3 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 25.00 | 0 | 11.33 | 8.53 | 29.44 | 68 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 40.00 | 1.40 | 15.05 | 12.04 | -- | 21 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 30.20 | .50 | 11.87 | 6.46 | NLT 5 | 39 | 2 |
| Oxygen, dissolved, percent saturation (percent) | 213.00 | 3.00 | 101.12 | 40.25 | -- | 34 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 15.00 | 0 | 5.00 | 4.32 | -- | 8 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 890.00 | 140.00 | 294.10 | 140.95 | -- | 39 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 280.00 | 0 | 19.46 | 38.22 | -- | 68 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,240.00 | 282.00 | 561.36 | 226.35 | -- | 22 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,570.00 | 256.00 | 538.51 | 263.87 | -- | 39 | -- |
| Dissolved solids, tons per acre-foot | 2.14 | .35 | .74 | .36 | -- | 39 | -- |
| Dissolved solids, tons per day | 946.00 | .19 | 206.29 | 223.73 | -- | 39 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 82.00 | 3.00 | 28.95 | 22.54 | -- | 21 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 190.00 | 33.00 | 62.31 | 28.80 | -- | 39 | -- |
| Magnesium, dissolved (mg/L as Mg) | 100.00 | 15.00 | 33.67 | 16.78 | -- | 39 | -- |
| Sodium, dissolved (mg/L as Na) | 210.00 | 23.00 | 71.97 | 40.19 | -- | 39 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 51.00 | 24.00 | 32.49 | 4.97 | NGT 60 | 39 | 0 |
| Sodium-adsorption ratio (SAR) | 4.00 | .90 | 1.76 | .75 | -- | 39 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 242.00 | 35.00 | 86.12 | 43.12 | -- | 39 | -- |
| Potassium, dissolved (mg/L as K) | 32.00 | 7.50 | 14.14 | 3.99 | -- | 39 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 520.00 | 520.00 | 520.00 | -- | -- | 1 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 0 | 0 | 0 | -- | -- | 1 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 567.00 | 236.00 | 322.29 | 118.16 | -- | 7 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 822.00 | 142.00 | 264.16 | 127.82 | -- | 37 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | 5.30 | 5.30 | 5.30 | -- | -- | 1 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 440.00 | 55.00 | 157.10 | 80.46 | 450 | 39 | 0 |
| Chloride, dissolved (mg/L as Cl) | 100.00 | 7.90 | 29.74 | 21.78 | 175 | 39 | 0 |
| Fluoride, total (mg/L as F) | <0.10 | -- | -- | -- | -- | 1 | -- |
| Fluoride, dissolved (mg/L as F) | .50 | .10 | .22 | .08 | -- | 39 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 71.00 | .86 | 12.68 | 12.59 | -- | 35 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.59 | 0.09 | 0.27 | 0.19 | 1 | 7 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | 1.10 | 1.00 | 1.05 | .07 | -- | 2 | -- |
| Nitrite, total (mg/L as N) | .03 | .01 | .02 | .01 | -- | *7 | -- |
| Nitrite, dissolved (mg/L as N) | .12 | .01 | .03 | .04 | -- | *38 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .39 | .03 | .11 | .12 | -- | 8 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .60 | .20 | .33 | .23 | -- | *7 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .62 | .10 | .27 | .20 | -- | *38 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 2.00 | .01 | .20 | .37 | -- | *38 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | 2.60 | .01 | .26 | .48 | -- | 36 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .07 | 0 | .01 | .01 | .02 | 31 | 2 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .31 | .11 | .20 | .06 | -- | 6 | -- |
| Phosphorus, dissolved (mg/L as P) | .80 | .01 | .09 | .13 | .10 | 37 | 9 |
| Phosphate, ortho, total (mg/L as P) | .90 | .05 | .22 | .33 | -- | 6 | PE |
| Phosphate, ortho, dissolved (mg/L as P) | .70 | 0 | .07 | .12 | -- | *38 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 2.10 | .01 | .20 | .35 | -- | 34 | PE |
| Carbon, organic, total (mg/L as C) | 13.00 | 13.00 | 13.00 | -- | -- | 1 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, total (µg/L as Sb) | 1.00 | 1.00 | 1.00 | -- | -- | *4 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Arsenic, total (µg/L as As) | 10.00 | 2.00 | 4.17 | 2.93 | 50 | 6 | 0 |
| Arsenic, dissolved (µg/L as As) | 6.00 | 2.00 | 3.00 | 1.15 | -- | *15 | -- |
| Barium, total (µg/L as Ba) | 200.00 | 100.00 | 120.00 | 44.72 | -- | *6 | -- |
| Barium, dissolved (µg/L as Ba) | 140.00 | 40.00 | 72.33 | 26.71 | 1,000 | 12 | 0 |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 6 | -- |
| Beryllium, dissolved (µg/L as Be) | .60 | .60 | .60 | -- | -- | *12 | -- |
| Boron, total (µg/L as B) | 720.00 | 40.00 | 260.00 | 72.86 | -- | 5 | -- |
| Boron, dissolved (µg/L as B) | 4,200.00 | 60.00 | 281.03 | 650.63 | 750 | 39 | 1 |
| Cadmium, total (µg/L as Cd) | <1.00 | -- | -- | -- | 10 | 7 | 0 |
| Cadmium, dissolved (µg/L as Cd) | 1.00 | 1.00 | 1.00 | 0 | -- | *15 | -- |
| Chromium, total (µg/L as Cr) | 6.00 | 6.00 | 6.00 | -- | 50 | 1 | 0 |
| Chromium, dissolved (µg/L as Cr) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 11 | -- |
| Copper, dissolved (µg/L as Cu) | 3.00 | 1.00 | 1.50 | .63 | -- | *21 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .005 | 7 | NC |
| Cyanide, dissolved (mg/L as CN) | <.01 | -- | -- | -- | -- | 14 | -- |
| Iron, total (µg/L as Fe) | 1,000.00 | 1,000.00 | 1,000.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 84.00 | 3.00 | 18.16 | 18.70 | -- | *39 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 8.00 | 2.00 | 3.80 | 2.39 | 50 | *21 | 0 |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | -- | -- | -- | -- | -- | 0 | -- |
| Manganese, dissolved (µg/L as Mn) | 5,700.00 | 2.00 | 192.24 | 919.20 | -- | *39 | -- |
| Mercury, dissolved (µg/L as Hg) | .30 | .10 | .19 | .07 | -- | *21 | -- |
| Molybdenum, dissolved (µg/L as Mo) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, total (µg/L as Ni) | 12.00 | 2.00 | 5.83 | 3.49 | -- | 6 | -- |
| Nickel, dissolved (µg/L as Ni) | 5.00 | 1.00 | 2.80 | 1.23 | -- | *12 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | 10 | 6 | 0 |
| Selenium, dissolved (µg/L as Se) | 2.00 | 2.00 | 2.00 | -- | -- | *21 | -- |
| Silver, total (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Strontium, dissolved (µg/L as Sr) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 3 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 7 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | 26.00 | 3.00 | 8.50 | 5.19 | -- | *21 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | <.10 | -- | -- | -- | .15 | 7 | 0 |
| PCB, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Alachlor, total, recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Aldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Aldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | <0.10 | -- | -- | -- | -- | 7 | -- |
| Atrazine, total (µg/L) | .20 | 0.10 | 0.15 | 0.06 | -- | *7 | -- |
| Chlordane, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Chlordane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Cyanazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| DDD, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDD, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDE, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDE, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDT, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| DDT, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DEF, total (µg/L) | <.01 | -- | -- | -- | -- | 1 | -- |
| Diazinon, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Diazinon, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Dieldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Dieldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Disyston, total (µg/L) | <.01 | -- | -- | -- | -- | 2 | -- |
| Endosulfan, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Endosulfan, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Endrin, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Endrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Ethion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Ethion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | <0.10 | -- | -- | -- | -- | 5 | -- |
| Heptachlor, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Heptachlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Heptachlor epoxide, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Heptachlor epoxide, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Lindane, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Lindane, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Malathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Malathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methomyl, total (µg/L) | <2.00 | -- | -- | -- | -- | 6 | -- |
| Methoxychlor, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methoxychlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methyl parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Methyl trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Mirex, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Mirex, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| PCN, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| PCN, dissolved (µg/L) | <0.10 | -- | -- | -- | -- | 6 | -- |
| Parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Perthane, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Perthane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Phorate, total (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Prometone, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Prometryne, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Propazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Propham, total (µg/L) | <2.00 | -- | -- | -- | -- | 5 | -- |
| Sevin, total (µg/L) | <2.00 | -- | -- | -- | -- | 6 | -- |
| Silvex, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Simazine, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Simetryne, total (µg/L) | <.10 | -- | -- | -- | -- | 7 | -- |
| Toxaphene, total (µg/L) | <1.00 | -- | -- | -- | -- | 7 | -- |
| Toxaphene, dissolved (µg/L) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Trifluralin, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 4 | -- |
| Trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| Trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| 2,4-D, total (µg/L) | .39 | 0.04 | 0.12 | 0.14 | -- | 6 | -- |
| 2,4-DP, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |
| 2,4,5-T, total (µg/L) | <.01 | -- | -- | -- | -- | 7 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 64.00 | 64.00 | 64.00 | -- | -- | 1 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 4.40 | 4.40 | 4.40 | -- | -- | 1 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 14.--Summary of water-quality data for station 06470875, James River at Dakota Lake Dam near Ludden, North Dakota, April 22, 1982, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 28.00 | 86.75 | 22.20 | -- | 16 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 100.00 | 5.00 | 51.33 | 27.36 | -- | 18 | -- |
| Sediment discharge, tons per day | 215.00 | .02 | 38.00 | 58.48 | -- | 18 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; NC, not calculated; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; *, mean and standard diviation computed from fewer measurements; PE, no state standard exists for this constituent, but some concentrations exceed the state standard for a related constituent; µg/L, micrograms per liter; <, less than; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 420.00 | 174.00 | 260.40 | 97.50 | -- | 5 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 3,900.00 | 255.00 | 899.74 | 677.38 | -- | 34 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,170.00 | 664.00 | 932.57 | 164.09 | -- | 7 | -- |
| pH, field (units) | 9.00 | 7.50 | 8.26 | .43 | 7.0 - 8.5 | 29 | 7 |
| pH, laboratory (units) | 8.60 | 7.70 | 8.09 | .31 | 7.0 - 8.5 | 8 | 1 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 26.00 | 0 | 11.56 | 9.07 | 29.44 | 34 | 0 |
| Color (platinum-cobalt units) | 140.00 | 5.00 | 33.70 | 27.65 | -- | 27 | -- |
| Turbidity (NTU) | -- | -- | -- | -- | -- | 0 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 30.40 | 4.30 | 11.61 | 6.61 | NLT 5 | 22 | 1 |
| Oxygen, dissolved, percent saturation (percent) | 224.00 | 30.00 | 115.93 | 45.42 | -- | 14 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 1,700.00 | 95.00 | 365.18 | 331.24 | -- | 28 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 1,000.00 | 0 | 59.74 | 171.44 | -- | 34 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 2,960.00 | 177.00 | 670.18 | 564.30 | -- | 28 | -- |
| Dissolved solids, sum of constituents (mg/L) | 2,770.00 | 157.00 | 658.39 | 544.12 | -- | 28 | -- |
| Dissolved solids, tons per acre-foot | 4.03 | .24 | .91 | .77 | -- | 28 | -- |
| Dissolved solids, tons per day | NC | -- | -- | -- | -- | 28 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 380.00 | 23.00 | 79.68 | 73.09 | -- | 28 | -- |
| Magnesium, dissolved (mg/L as Mg) | 190.00 | 9.10 | 40.40 | 36.90 | -- | 28 | -- |
| Sodium, dissolved (mg/L as Na) | 450.00 | 12.00 | 92.89 | 88.43 | -- | 28 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 47.00 | 20.00 | 33.00 | 6.03 | NGT 60 | 28 | 0 |
| Sodium-adsorption ratio (SAR) | 5.00 | .60 | 2.05 | 1.08 | -- | 28 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 490.00 | 20.90 | 107.49 | 95.06 | -- | 28 | -- |
| Potassium, dissolved (mg/L as K) | 40.00 | 8.90 | 14.60 | 6.88 | -- | 28 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | 10.00 | 7.20 | 9.15 | 1.31 | -- | 4 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | 290.00 | 290.00 | 290.00 | -- | -- | 1 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 850.00 | 79.00 | 300.00 | 200.49 | -- | 22 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 340.00 | 190.00 | 257.50 | 42.68 | -- | 8 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | .90 | .90 | .90 | -- | -- | 1 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 1,000.00 | 36.00 | 199.93 | 189.00 | 450 | 28 | 2 |
| Chloride, dissolved (mg/L as Cl) | 250.00 | 5.50 | 43.95 | 49.74 | 175 | 28 | 1 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .60 | .10 | .24 | .12 | -- | 28 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 38.00 | .80 | 10.83 | 10.72 | -- | 28 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.06 | 0.06 | 0.06 | -- | 1 | 1 | 0 |
| Nitrate, dissolved (mg/L as $NO_3$) | .27 | .27 | .27 | -- | -- | 1 | -- |
| Nitrite, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, dissolved (mg/L as N) | .01 | .01 | .01 | -- | -- | 1 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .03 | .03 | .03 | -- | -- | 1 | -- |
| Nitrite plus nitrate, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .91 | 0 | .11 | 0.22 | -- | *28 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .09 | .09 | .09 | -- | -- | 1 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .12 | .12 | .12 | -- | -- | 1 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .01 | .01 | .01 | -- | .02 | 1 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, dissolved (mg/L as P) | .60 | 0 | .16 | .17 | .10 | 28 | 15 |
| Phosphate, ortho, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .28 | .28 | .28 | -- | -- | 1 | PE |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | .86 | .86 | .86 | -- | -- | 1 | PE |
| Carbon, organic, total (mg/L as C) | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | <100.00 | -- | -- | -- | -- | 1 | -- |
| Antimony, total (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, dissolved (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Arsenic, total (µg/L as As) | -- | -- | -- | -- | 50 | 0 | -- |
| Arsenic, dissolved (µg/L as As) | 2.00 | 2.00 | 2.00 | -- | -- | 1 | -- |
| Barium, total (µg/L as Ba) | -- | -- | -- | -- | -- | 0 | -- |
| Barium, dissolved (µg/L as Ba) | 30.00 | 30.00 | 30.00 | -- | 1,000 | 1 | 0 |
| Beryllium, total (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Beryllium, dissolved (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, total (µg/L as B) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, dissolved (µg/L as B) | 1,100.00 | 70.00 | 264.64 | 210.05 | 750 | 28 | 1 |
| Cadmium, total (µg/L as Cd) | -- | -- | -- | -- | 10 | 0 | -- |
| Cadmium, dissolved (µg/L as Cd) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Chromium, total (µg/L as Cr) | -- | -- | -- | -- | 50 | 0 | -- |
| Chromium, dissolved (µg/L as Cr) | -- | -- | -- | -- | -- | 0 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 1 | -- |
| Copper, dissolved (µg/L as Cu) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .005 | 1 | NC |
| Cyanide, dissolved (mg/L as CN) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, total (µg/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, dissolved (µg/L as Fe) | 40.00 | 40.00 | 40.00 | -- | -- | 1 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | -- | -- | -- | -- | 50 | 1 | 0 |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Manganese, dissolved (µg/L as Mn) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 1 | -- |
| Molybdenum, dissolved (µg/L as Mo) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Nickel, total (µg/L as Ni) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, dissolved (µg/L as Ni) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Selenium, total (µg/L as Se) | -- | -- | -- | -- | 10 | 0 | -- |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 1 | -- |
| Silver, total (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Silver, dissolved (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Strontium, dissolved (µg/L as Sr) | 100.00 | 100.00 | 100.00 | -- | -- | 1 | -- |
| Thallium, total (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, dissolved (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Vanadium, dissolved (µg/L as V) | 1.00 | 1.00 | 1.00 | -- | -- | 1 | -- |
| Zinc, dissolved (µg/L as Zn) | <3.00 | -- | -- | -- | -- | 1 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .15 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 15.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to North Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | North Dakota standard | Total number of measurements | Number of measurements exceeding North Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sediment discharge, tons per day | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; NC, not calculated; meq/L, milliequivalents per liter; NGT, not greater than; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; µg/L, micrograms per liter; <, less than; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 420.00 | 174.00 | 260.40 | 97.50 | -- | 5 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 3,900.00 | 255.00 | 899.74 | 677.38 | -- | 34 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,170.00 | 664.00 | 932.57 | 164.09 | -- | 7 | -- |
| pH, field (units) | 9.00 | 7.50 | 8.26 | .43 | 6.5 - 9.0 | 29 | 0 |
| pH, laboratory (units) | 8.60 | 7.70 | 8.09 | .31 | 6.5 - 9.0 | 8 | 0 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 26.00 | 0 | 11.56 | 9.07 | 32.22 | 34 | 0 |
| Color (platinum-cobalt units) | 140.00 | 5.00 | 33.70 | 27.65 | -- | 27 | -- |
| Turbidity (NTU) | -- | -- | -- | -- | -- | 0 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 30.40 | 4.30 | 11.61 | 6.61 | NLT 5 | 22 | 1 |
| Oxygen, dissolved, percent saturation (percent) | 224.00 | 30.00 | 115.93 | 45.42 | -- | 14 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 1,700.00 | 95.00 | 365.18 | 331.24 | -- | 28 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 1,000.00 | 0 | 59.74 | 171.44 | -- | 34 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 2,960.00 | 177.00 | 670.18 | 564.30 | -- | 28 | -- |
| Dissolved solids, sum of constituents (mg/L) | 2,770.00 | 157.00 | 658.39 | 544.12 | -- | 28 | -- |
| Dissolved solids, tons per acre-foot | 4.03 | .24 | .91 | .77 | -- | 28 | -- |
| Dissolved solids, tons per day | NC | -- | -- | -- | -- | 28 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | -- | -- | -- | -- | 90 | 0 | -- |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 380.00 | 23.00 | 79.68 | 73.09 | -- | 28 | -- |
| Magnesium, dissolved (mg/L as Mg) | 190.00 | 9.10 | 40.40 | 36.90 | -- | 28 | -- |
| Sodium, dissolved (mg/L as Na) | 450.00 | 12.00 | 92.89 | 88.43 | -- | 28 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 47.00 | 20.00 | 33.00 | 6.01 | -- | 28 | -- |
| Sodium-adsorption ratio (SAR) | 5.00 | .60 | 2.05 | 1.08 | -- | 28 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 490.00 | 20.90 | 107.49 | 95.06 | -- | 28 | -- |
| Potassium, dissolved (mg/L as K) | 40.00 | 8.90 | 14.60 | 6.88 | -- | 28 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | 10.00 | 7.20 | 9.15 | 1.31 | -- | 4 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | 290.00 | 290.00 | 290.00 | -- | -- | 1 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 850.00 | 79.00 | 300.00 | 200.49 | -- | 22 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 340.00 | 190.00 | 257.50 | 42.68 | -- | 8 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | .90 | .90 | .90 | -- | -- | 1 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 1,000.00 | 36.00 | 199.93 | 189.00 | -- | 28 | -- |
| Chloride, dissolved (mg/L as Cl) | 250.00 | 5.50 | 43.95 | 49.74 | -- | 28 | -- |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .60 | .10 | .24 | .12 | -- | 28 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 38.00 | .80 | 10.83 | 10.72 | -- | 28 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.06 | 0.06 | 0.06 | -- | -- | 1 | -- |
| Nitrate, dissolved (mg/L as $NO_3$) | .27 | .27 | .27 | -- | -- | 1 | -- |
| Nitrite, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, dissolved (mg/L as N) | .01 | .01 | .01 | -- | -- | 1 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .03 | .03 | .03 | -- | -- | 1 | -- |
| Nitrite plus nitrate, total (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .91 | 0 | .11 | .22 | -- | *28 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .09 | .09 | .09 | -- | -- | 1 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .12 | .12 | .12 | -- | -- | 1 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .01 | .01 | .01 | -- | .04 | 1 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, dissolved (mg/L as P) | .60 | 0 | .16 | .17 | -- | 28 | -- |
| Phosphate, ortho, total (mg/L as P) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .28 | .28 | .28 | -- | -- | 1 | -- |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | .86 | .86 | .86 | -- | -- | 1 | -- |
| Carbon, organic, total (mg/L as C) | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | <100.00 | -- | -- | -- | -- | 1 | -- |
| Antimony, total (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, dissolved (µg/L as Sb) | -- | -- | -- | -- | -- | 0 | -- |
| Arsenic, total (µg/L as As) | -- | -- | -- | -- | -- | 0 | -- |
| Arsenic, dissolved (µg/L as As) | 2.00 | 2.00 | 2.00 | -- | -- | 1 | -- |
| Barium, total (µg/L as Ba) | -- | -- | -- | -- | -- | 0 | -- |
| Barium, dissolved (µg/L as Ba) | 30.00 | 30.00 | 30.00 | -- | -- | 1 | -- |
| Beryllium, total (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Beryllium, dissolved (µg/L as Be) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, total (µg/L as B) | -- | -- | -- | -- | -- | 0 | -- |
| Boron, dissolved (µg/L as B) | 1,100.00 | 70.00 | 264.64 | 210.05 | -- | 28 | -- |
| Cadmium, total (µg/L as Cd) | -- | -- | -- | -- | -- | 0 | -- |
| Cadmium, dissolved (µg/L as Cd) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Chromium, total (µg/L as Cr) | -- | -- | -- | -- | -- | 0 | -- |
| Chromium, dissolved (µg/L as Cr) | -- | -- | -- | -- | -- | 1 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 1 | -- |
| Copper, dissolved (µg/L as Cu) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Cyanide, total (mg/L as CN) | <.01 | 0 | 0 | -- | .020 | 1 | 0 |
| Cyanide, dissolved (mg/L as CN) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, total (µg/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Iron, dissolved (µg/L as Fe) | 40.00 | 40.00 | 40.00 | -- | -- | 1 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | -- | -- | -- | -- | -- | 1 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Manganese, dissolved (µg/L as Mn) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 1 | -- |
| Molybdenum, dissolved (µg/L as Mo) | <10.00 | -- | -- | -- | -- | 1 | -- |
| Nickel, total (µg/L as Ni) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, dissolved (µg/L as Ni) | <2.00 | -- | -- | -- | -- | 1 | -- |
| Selenium, total (µg/L as Se) | -- | -- | -- | -- | -- | 0 | -- |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 1 | -- |
| Silver, total (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Silver, dissolved (µg/L as Ag) | -- | -- | -- | -- | -- | 0 | -- |
| Strontium, dissolved (µg/L as Sr) | 100.00 | 100.00 | 100.00 | -- | -- | 1 | -- |
| Thallium, total (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, dissolved (µg/L as Tl) | -- | -- | -- | -- | -- | 0 | -- |
| Vanadium, dissolved (µg/L as V) | 1.00 | 1.00 | 1.00 | -- | -- | 1 | -- |
| Zinc, dissolved (µg/L as Zn) | <3.00 | -- | -- | -- | -- | 1 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .001 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 16.--Summary of water-quality data for station 06470878, James River at North Dakota-South Dakota State line, January 2, 1979, to September 14, 1982, and April 9, 1987, compared to South Dakota standards--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Sediment data--Continued | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sediment discharge, tons per day | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota,

July 22, 1981, and February 22, 1984, to November 16, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; µg/L, micrograms per liter; <, less than; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 1,200.00 | 0.10 | 210.12 | 270.12 | -- | 22 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 1,780.00 | 410.00 | 846.96 | 354.97 | -- | 23 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,850.00 | 413.00 | 890.70 | 361.78 | -- | 20 | -- |
| pH, field (units) | 8.95 | 7.70 | 8.41 | .38 | 6.5 - 9.0 | 21 | 0 |
| pH, laboratory (units) | 8.60 | 7.70 | 8.10 | .25 | 6.5 - 9.0 | 20 | 0 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 27.00 | 0 | 8.96 | 8.64 | 32.22 | 25 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 35.00 | 1.30 | 12.28 | 9.66 | -- | 20 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 24.50 | .50 | 10.91 | 4.91 | NLT 5 | 20 | 1 |
| Oxygen, dissolved, percent saturation (percent) | 168.00 | 3.00 | 90.25 | 30.89 | -- | 20 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 5.00 | 5.00 | 5.00 | -- | -- | 1 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 590.00 | 140.00 | 304.50 | 117.94 | -- | 20 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 160.00 | 0 | 30.88 | 34.78 | -- | 25 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,240.00 | 270.00 | 572.65 | 246.07 | -- | 20 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,330.00 | 250.00 | 563.00 | 253.34 | -- | 20 | -- |
| Dissolved solids, tons per acre-foot | 1.69 | .37 | .78 | .33 | -- | 20 | -- |
| Dissolved solids, tons per day | 875.00 | 0 | 205.56 | 219.21 | -- | 20 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 73.00 | 2.00 | 26.30 | 19.79 | 90 | 20 | 0 |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 120.00 | 33.00 | 62.80 | 22.27 | -- | 20 | -- |
| Magnesium, dissolved (mg/L as Mg) | 77.00 | 15.00 | 35.55 | 15.62 | -- | 20 | -- |
| Sodium, dissolved (mg/L as Na) | 190.00 | 22.00 | 77.05 | 42.49 | -- | 20 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 52.00 | 23.00 | 33.00 | 5.87 | -- | 20 | -- |
| Sodium-adsorption ratio (SAR) | 4.00 | .80 | 1.84 | .82 | -- | 20 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 209.00 | 35.00 | 90.69 | 44.24 | -- | 20 | -- |
| Potassium, dissolved (mg/L as K) | 19.00 | 8.80 | 13.64 | 2.34 | -- | 20 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 358.00 | 337.00 | 347.50 | 14.85 | -- | 2 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 567.00 | 136.00 | 265.05 | 100.06 | -- | 20 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | -- | -- | -- | -- | -- | 0 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 380.00 | 57.00 | 166.35 | 78.42 | -- | 20 | -- |
| Chloride, dissolved (mg/L as Cl) | 87.00 | 11.00 | 32.50 | 21.55 | -- | 20 | -- |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 130.00 | .70 | 18.55 | 29.10 | -- | 17 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 0.70 | 0.10 | 0.32 | 0.33 | -- | 3 | -- |
| Nitrate, dissolved (mg/L as $NO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Nitrite, total (mg/L as N) | .03 | .01 | .02 | .01 | -- | *6 | -- |
| Nitrite, dissolved (mg/L as N) | .04 | .02 | .03 | .01 | -- | *20 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .13 | .07 | .10 | .03 | -- | 3 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .70 | .10 | .33 | .32 | -- | *6 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | .73 | .12 | .30 | .29 | -- | *20 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | .14 | .01 | .07 | .09 | -- | *3 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | .18 | .01 | .09 | .12 | -- | 2 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | -- | -- | -- | -- | .04 | 0 | -- |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .20 | .10 | .17 | .05 | -- | *5 | -- |
| Phosphorus, dissolved (mg/L as P) | 2.30 | .01 | .20 | .52 | -- | *20 | -- |
| Phosphate, ortho, total (mg/L as P) | .50 | .06 | .18 | .19 | -- | 5 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .37 | .01 | .08 | .10 | -- | *13 | -- |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 1.10 | .02 | .23 | .31 | -- | 12 | -- |
| Carbon, organic, total (mg/L as C) | 14.00 | 14.00 | 14.00 | -- | -- | 1 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | 0 | -- |
| Antimony, total (µg/L as Sb) | 1.00 | 1.00 | 1.00 | -- | -- | *5 | -- |
| Antimony, dissolved (µg/L as Sb) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Arsenic, total (µg/L as As) | 6.00 | 2.00 | 3.60 | 1.52 | -- | 5 | -- |
| Arsenic, dissolved (µg/L as As) | 4.00 | 2.00 | 2.69 | .75 | -- | 13 | -- |
| Barium, total (µg/L as Ba) | 100.00 | 100.00 | 100.00 | 0 | -- | *5 | -- |
| Barium, dissolved (µg/L as Ba) | 140.00 | 37.00 | 71.80 | 28.18 | -- | 10 | -- |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | *5 | -- |
| Beryllium, dissolved (µg/L as Be) | 2.00 | .50 | 1.25 | 1.06 | -- | *10 | -- |
| Boron, total (µg/L as B) | 240.00 | 40.00 | 130.00 | 88.69 | -- | 4 | -- |
| Boron, dissolved (µg/L as B) | 410.00 | 60.00 | 184.50 | 87.87 | -- | 20 | -- |
| Cadmium, total (µg/L as Cd) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Cadmium, dissolved (µg/L as Cd) | 1.00 | 1.00 | 1.00 | 0 | -- | *13 | -- |
| Chromium, total (µg/L as Cr) | 4.00 | 4.00 | 4.00 | -- | -- | 1 | -- |
| Chromium, dissolved (µg/L as Cr) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Cobalt, dissolved (µg/L as Co) | <3.00 | -- | -- | -- | -- | 9 | -- |
| Copper, dissolved (µg/L as Cu) | 3.00 | 1.00 | 1.80 | .94 | -- | *20 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .020 | 5 | 0 |
| Cyanide, dissolved (mg/L as CN) | .01 | .01 | .01 | -- | -- | *12 | -- |
| Iron, total (µg/L as Fe) | 1,200.00 | 1,200.00 | 1,200.00 | -- | -- | 1 | -- |
| Iron, dissolved (µg/L as Fe) | 66.00 | 3.00 | 13.05 | 15.38 | -- | *20 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 5.00 | 2.00 | 3.00 | 1.41 | -- | *20 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | -- | -- | -- | -- | -- | 0 | -- |
| Manganese, dissolved (µg/L as Mn) | 160.00 | 5.00 | 36.16 | 39.39 | -- | 19 | -- |
| Mercury, dissolved (µg/L as Hg) | .90 | .10 | .31 | .22 | -- | *20 | -- |
| Molybdenum, dissolved (µg/L as Mo) | -- | -- | -- | -- | -- | 0 | -- |
| Nickel, total (µg/L as Ni) | 15.00 | 2.00 | 5.40 | 5.41 | -- | 5 | -- |
| Nickel, dissolved (µg/L as Ni) | 5.00 | 2.00 | 2.87 | 1.13 | -- | *9 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Selenium, dissolved (µg/L as Se) | <1.00 | -- | -- | -- | -- | 20 | -- |
| Silver, total (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 5 | -- |
| Silver, dissolved (µg/L as Ag) | <1.00 | -- | -- | -- | -- | 10 | -- |
| Strontium, dissolved (µg/L as Sr) | -- | -- | -- | -- | -- | 0 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 3 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | 0 | -- |
| Zinc, dissolved (µg/L as Zn) | 33.00 | 6.00 | 14.64 | 8.21 | -- | *20 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | -- | -- | -- | -- | .001 | 0 | -- |
| PCB, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Alachlor, total, recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Aldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Atrazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlordane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Cyanazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDD, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDE, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DDT, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| DEF, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Diazinon, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Dieldrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Disyston, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endosulfan, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Endrin, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Ethion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| | | | Pesticides--Continued | | | | |
| Guthion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Heptachlor epoxide, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Lindane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Malathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methomyl, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methoxychlor, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Methyl trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Mirex, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| PCN, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Parathion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Perthane, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Phorate, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometone, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Prometryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Propham, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Sevin, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Silvex, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simazine, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Simetryne, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Toxaphene, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trifluralin, total recoverable (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Trithion, dissolved (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-D, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4-DP, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| 2,4,5-T, total (µg/L) | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 50.00 | 38.00 | 44.00 | 8.49 | -- | 2 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 6.39 | 3.50 | 4.94 | 2.04 | -- | 2 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 17.--Summary of water-quality data for station 06470980, James River near Hecla, South Dakota, July 22, 1981, and February 22, 1984, to November 16, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 100.00 | 89.00 | 96.75 | 3.65 | -- | 8 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended concentration (mg/L) | 129.00 | 9.00 | 47.12 | 29.85 | -- | 16 | -- |
| Sediment discharge, tons per day | 93.00 | 0 | 27.73 | 29.46 | -- | 16 | -- |

Table 18.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Mud Lake pool, South Dakota, June 27, 1984, to July 9, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 6,100.00 | 350.00 | 899.42 | 606.09 | -- | 156 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,220.00 | 410.00 | 838.61 | 160.80 | -- | 158 | -- |
| pH, field (units) | 9.67 | 7.44 | 8.27 | .40 | 6.5 - 9.0 | 156 | 11 |
| pH, laboratory (units) | 8.41 | 5.11 | 7.52 | .93 | 6.5 - 9.0 | 15 | 2 |
| Oxidation reduction potential (mV) | .41 | .00 | .15 | .05 | -- | 156 | -- |
| Temperature, water (°C) | 26.80 | 4.90 | 18.22 | 5.69 | 32.22 | 149 | 0 |
| Turbidity (NTU) | 165.00 | 1.00 | 47.97 | 33.04 | -- | 91 | -- |
| Turbidity, at mid-depth (NTU) | 56.00 | 10.00 | 30.13 | 12.77 | -- | 15 | -- |
| Transparency, secchi disk (in.) | .90 | .12 | .37 | .16 | -- | 153 | -- |
| Oxygen, dissolved (mg/L) | 15.30 | 2.60 | 8.49 | 2.57 | NLT 5 | 156 | 5 |
| Dissolved solids, sum of constituents (mg/L) | 744.53 | 237.20 | 503.67 | 94.91 | -- | 157 | -- |
| Suspended solids, inorganic (mg/L) | 275.00 | 2.00 | 24.05 | 34.90 | 90 | 118 | 4 |
| Suspended solids, organic (mg/L) | 173.60 | 0 | 14.95 | 19.18 | 90 | 118 | 2 |

Table 18.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Mud Lake pool, South Dakota, June 27, 1984, to July 9, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 68.20 | 15.40 | 51.56 | 10.58 | -- | 158 | -- |
| Magnesium, dissolved (mg/L as Mg) | 52.80 | 15.40 | 32.49 | 5.89 | -- | 158 | -- |
| Sodium, dissolved (mg/L as Na) | 160.60 | 26.40 | 77.09 | 21.65 | -- | 158 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 52.73 | 23.19 | 36.91 | 5.58 | -- | 158 | -- |
| Sodium-adsorption ratio (SAR) | 4.08 | .88 | 2.07 | .53 | -- | 158 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 179.74 | 38.28 | 91.84 | 23.24 | -- | 158 | -- |
| Potassium, dissolved (mg/L as K) | 19.47 | 9.68 | 14.75 | 2.36 | -- | 158 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 494.10 | .20 | 297.09 | 69.85 | -- | 157 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 71.40 | 0 | 6.15 | 12.18 | -- | 157 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 528.00 | 285.00 | 402.14 | 50.59 | -- | 14 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 326.95 | 50.20 | 147.74 | 40.35 | -- | 158 | -- |
| Chloride, dissolved (mg/L as Cl) | 65.47 | 12.43 | 26.96 | 9.63 | -- | 158 | -- |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | .18 | 0 | .01 | .03 | -- | 156 | -- |
| Nitrite, dissolved (mg/L as N) | .03 | 0 | 0 | .01 | -- | 159 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.34 | 0 | .25 | .23 | -- | 159 | -- |

Table 18.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Mud Lake pool, South Dakota, June 27, 1984, to July 9, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 | 14 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 7.82 | .46 | 2.21 | 1.27 | -- | 159 | -- |
| Phosphorus, total (mg/L as P) | .87 | .04 | .29 | .17 | -- | 159 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .74 | .01 | .12 | .11 | -- | 159 | -- |
| Carbon, organic, total (mg/L as C) | 19.00 | 12.00 | 15.42 | 2.25 | -- | 6 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 10.20 | 1.20 | 3.98 | 2.20 | -- | 17 | -- |
| Cadmium, dissolved (µg/L as Cd) | .30 | .24 | .28 | .03 | -- | *17 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 17 | -- |
| Lead, dissolved (µg/L as Pb) | 2.80 | 1.10 | 1.77 | .54 | -- | *17 | -- |
| Mercury, dissolved (µg/L as Hg) | .13 | .13 | .13 | -- | -- | *17 | -- |
| Selenium, dissolved (µg/L as Se) | 1.40 | 1.00 | 1.20 | .20 | -- | *17 | -- |
| Zinc, dissolved (µg/L as Zn) | <20.00 | -- | -- | -- | -- | 17 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 369.92 | 1.83 | 65.37 | 59.54 | -- | 67 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 8.59 | 0 | 3.15 | 2.63 | -- | 67 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 11.42 | 0 | 3.87 | 3.50 | -- | 67 | -- |

Table 19.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Sand Lake pool, South Dakota, July 24, 1984, to July 8, 1987

[Data from U.S. Bureau of Reclamation; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; µg/L, micrograms per liter; *, mean and standard deviation computed from fewer measurements; <, less than; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | 1,800.00 | 380.00 | 752.88 | 142.81 | -- | 118 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 1,020.00 | 400.00 | 749.41 | 115.56 | -- | 119 | -- |
| pH, field (units) | 9.45 | 7.14 | 8.46 | .59 | 6.5 - 9.0 | 118 | 26 |
| pH, laboratory (units) | 8.74 | 6.07 | 7.69 | .75 | 6.5 - 9.0 | 17 | 2 |
| Oxidation reduction potential (mV) | .33 | .01 | .13 | .05 | -- | 118 | -- |
| Temperature, water (°C) | 26.30 | 5.20 | 18.56 | 5.60 | 32.22 | 115 | 0 |
| Turbidity (NTU) | 167.00 | 1.00 | 39.93 | 34.09 | -- | 67 | -- |
| Turbidity, at mid-depth (NTU) | 74.00 | 8.70 | 25.27 | 21.66 | -- | 17 | -- |
| Transparency, secchi disk (in.) | 1.84 | .10 | .61 | .32 | -- | 99 | -- |
| Oxygen, dissolved (mg/L) | 14.35 | .69 | 8.39 | 2.65 | NLT 5 | 115 | 13 |
| Dissolved solids, sum of constituents (mg/L) | 607.47 | 221.01 | 442.39 | 65.71 | -- | 119 | -- |
| Suspended solids, inorganic (mg/L) | 106.60 | 0 | 13.28 | 19.85 | 90 | 91 | 2 |
| Suspended solids, organic (mg/L) | 113.00 | 0 | 14.47 | 22.15 | 90 | 92 | 3 |

Table 19.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Sand Lake pool, South Dakota, July 24, 1984, to July 8, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 67.10 | 29.70 | 43.53 | 8.35 | -- | 119 | -- |
| Magnesium, dissolved (mg/L as Mg) | 44.00 | 14.30 | 29.80 | 4.85 | -- | 119 | -- |
| Sodium, dissolved (mg/L as Na) | 113.30 | 24.20 | 70.96 | 15.67 | -- | 119 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 47.34 | 23.55 | 37.83 | 4.95 | -- | 119 | -- |
| Sodium-adsorption ratio (SAR) | 2.86 | .84 | 2.03 | .41 | -- | 119 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 130.13 | 36.08 | 85.42 | 16.76 | -- | 119 | -- |
| Potassium, dissolved (mg/L as K) | 17.82 | 11.33 | 14.46 | 1.99 | -- | 119 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | 538.51 | 151.51 | 269.88 | 69.29 | -- | 119 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | 61.12 | 0 | 16.67 | 18.74 | -- | 119 | -- |
| Alkalinity, total (calculated; mg/L as $CaCO_3$) | 512.00 | 263.00 | 400.00 | 102.25 | -- | 16 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 158.55 | 44.80 | 107.80 | 23.04 | -- | 119 | -- |
| Chloride, dissolved (mg/L as Cl) | 36.26 | 11.96 | 25.51 | 6.77 | -- | 119 | -- |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 1.44 | 0 | .08 | .26 | -- | 115 | -- |
| Nitrite, dissolved (mg/L as N) | .33 | 0 | .02 | .06 | -- | 120 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.48 | .01 | .36 | .30 | -- | 120 | -- |

Table 19.--Summary of water-quality data for Sand Lake National Wildlife Refuge, Sand Lake pool, South Dakota, July 24, 1984, to July 8, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients--Continued** | | | | | | | |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 0.03 | 0.00 | 0.01 | 0.01 | 0.04 | 16 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | 6.20 | .34 | 2.34 | 1.26 | -- | 120 | -- |
| Phosphorus, total (mg/L as P) | 1.16 | .04 | .39 | .25 | -- | 120 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | 1.01 | .01 | .25 | .18 | -- | 120 | -- |
| Carbon, organic, total (mg/L as C) | 17.00 | 11.00 | 14.36 | 1.98 | -- | 14 | -- |
| **Trace elements** | | | | | | | |
| Arsenic, dissolved (µg/L as As) | 6.50 | 1.50 | 3.58 | 1.55 | -- | 17 | -- |
| Cadmium, dissolved (µg/L as Cd) | .37 | .20 | .26 | .07 | -- | *17 | -- |
| Copper, dissolved (µg/L as Cu) | <20.00 | -- | -- | -- | -- | 17 | -- |
| Lead, dissolved (µg/L as Pb) | 3.00 | 1.00 | 1.78 | .67 | -- | *17 | -- |
| Mercury, dissolved (µg/L as Hg) | <.10 | -- | -- | -- | -- | 17 | -- |
| Selenium, dissolved (µg/L as Se) | 1.10 | 1.10 | 1.10 | -- | -- | *17 | -- |
| Zinc, dissolved (µg/L as Zn) | 20.00 | 20.00 | 20.00 | 0 | -- | *17 | -- |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 111.22 | 2.65 | 37.13 | 29.70 | -- | 55 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 6.79 | 0 | 1.26 | 1.81 | -- | 55 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | 14.77 | 0 | 2.84 | 3.65 | -- | 55 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987

[Data from U.S. Geological Survey; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; NLT, not less than; meq/L, milliequivalents per liter; pCi/L, picocuries per liter; *, mean and standard deviation computed from fewer measurements; µg/L, micrograms per liter; <, less than; NC, not calculated; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties** | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 1,220.00 | .14 | 254.09 | 310.10 | -- | 103 | -- |
| Specific conductance, field (µS/cm at 25 °C) | 2,100.00 | 425.00 | 826.90 | 297.98 | -- | 100 | -- |
| Specific conductance, laboratory (µS/cm at 25 °C) | 2,370.00 | 344.00 | 949.18 | 378.54 | -- | 44 | -- |
| pH, field (units) | 9.40 | 6.60 | 7.80 | .45 | 6.5 - 9.0 | 76 | 1 |
| pH, laboratory (units) | 8.90 | 6.70 | 7.97 | .35 | 6.5 - 9.0 | 44 | 0 |
| Oxidation reduction potential (mV) | -- | -- | -- | -- | -- | 0 | -- |
| Temperature, water (°C) | 27.00 | 0 | 10.97 | 8.63 | 32.22 | 106 | 0 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | 0 | -- |
| Turbidity (NTU) | 32.00 | .80 | 5.81 | 5.46 | -- | 59 | -- |
| Transparency, secchi disk (in.) | -- | -- | -- | -- | -- | 0 | -- |
| Oxygen, dissolved (mg/L) | 17.00 | .10 | 7.75 | 3.96 | NLT 5 | 59 | 16 |
| Oxygen, dissolved, percent saturation (percent) | 116.00 | 10.00 | 68.09 | 29.37 | -- | 22 | -- |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Hardness, total (mg/L as $CaCO_3$) | 660.00 | 160.00 | 318.81 | 116.18 | -- | 59 | -- |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 430.00 | 0 | 13.34 | 43.48 | -- | 122 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Physical properties--Continued** | | | | | | | |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | 0 | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 1,190.00 | 273.00 | 588.87 | 208.88 | -- | 60 | -- |
| Dissolved solids, sum of constituents (mg/L) | 1,150.00 | 255.00 | 570.80 | 204.50 | -- | 59 | -- |
| Dissolved solids, tons per acre-foot | 1.62 | .37 | .80 | .28 | -- | 60 | -- |
| Dissolved solids, tons per day | 994.00 | .40 | 199.64 | 237.45 | -- | 60 | -- |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 35.00 | 7.00 | 16.00 | 9.13 | 90 | 16 | 0 |
| **Major constituents** | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 150.00 | 37.00 | 66.49 | 24.69 | -- | 59 | -- |
| Magnesium, dissolved (mg/L as Mg) | 77.00 | 16.00 | 37.36 | 13.53 | -- | 58 | -- |
| Sodium, dissolved (mg/L as Na) | 190.00 | 23.00 | 77.80 | 32.76 | -- | 59 | -- |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 41.00 | 21.00 | 32.88 | 4.61 | -- | 59 | -- |
| Sodium-adsorption ratio (SAR) | 3.00 | .80 | 1.86 | .58 | -- | 59 | -- |
| Sodium + potassium, dissolved (mg/L as Na + K) | 220.00 | 39.00 | 94.88 | 35.96 | -- | 58 | -- |
| Potassium, dissolved (mg/L as K) | 30.00 | 3.70 | 16.14 | 4.44 | -- | 58 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Major constituents--Continued** | | | | | | | |
| Potassium 40, dissolved (pCi/L) | 15.00 | 7.50 | 11.25 | 5.30 | -- | 2 | -- |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | -- | -- | -- | -- | 0 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | 570.00 | 161.00 | 297.34 | 105.45 | -- | 29 | -- |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 363.00 | 363.00 | 363.00 | -- | -- | 1 | -- |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 698.00 | 151.00 | 317.75 | 110.64 | -- | 44 | -- |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | 22.00 | 6.90 | 12.72 | 6.53 | -- | 4 | -- |
| Sulfate, dissolved (mg/L as $SO_4$) | 310.00 | 60.00 | 142.38 | 60.03 | -- | 60 | -- |
| Chloride, dissolved (mg/L as Cl) | 86.00 | .90 | 32.59 | 17.24 | -- | 59 | -- |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | 0 | -- |
| Fluoride, dissolved (mg/L as F) | .60 | .10 | .23 | .09 | -- | 52 | -- |
| Silica, dissolved (mg/L as $SiO_2$) | 46.00 | 1.30 | 14.50 | 9.07 | -- | 58 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Nutrients** | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 1.49 | 0.09 | 0.55 | 0.57 | -- | 5 | -- |
| Nitrate, dissolved (mg/L as $NO_3$) | 2.80 | 2.80 | 2.80 | -- | -- | 1 | -- |
| Nitrite, total (mg/L as N) | .04 | .01 | .03 | .02 | -- | *5 | -- |
| Nitrite, dissolved (mg/L as N) | .03 | .01 | .02 | .01 | -- | *20 | -- |
| Nitrite, dissolved (mg/L as $NO_2$) | .10 | .03 | .06 | .03 | -- | 8 | -- |
| Nitrite plus nitrate, total (mg/L as N) | .72 | 0 | .10 | .17 | -- | *24 | -- |
| Nitrite plus nitrate, dissolved (mg/L as N) | 1.50 | .01 | .27 | .31 | -- | *56 | -- |
| Nitrogen, ammonia, dissolved (mg/L as N) | 1.40 | .02 | .26 | .34 | -- | *48 | -- |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | 1.80 | 0 | .33 | .44 | -- | 47 | -- |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | .02 | 0 | 0 | 0 | .04 | 45 | 0 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | -- | -- | -- | -- | 0 | -- |
| Phosphorus, total (mg/L as P) | .77 | .07 | .29 | .17 | -- | 54 | -- |
| Phosphorus, dissolved (mg/L as P) | .71 | .01 | .22 | .16 | -- | *60 | -- |
| Phosphate, ortho, total (mg/L as P) | .25 | .12 | .19 | .05 | -- | 4 | -- |
| Phosphate, ortho, dissolved (mg/L as P) | .65 | .01 | .20 | .18 | -- | 37 | -- |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 2.00 | .03 | .60 | .53 | -- | 37 | -- |
| Carbon, organic, total (mg/L as C) | 31.00 | 9.70 | 18.06 | 6.24 | -- | 12 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements** | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | 80.00 | 10.00 | 25.00 | 27.39 | -- | *17 | -- |
| Antimony, total (µg/L as Sb) | 1.00 | 1.00 | 1.00 | -- | -- | *4 | -- |
| Antimony, dissolved (µg/L as Sb) | 1.00 | 1.00 | 1.00 | -- | -- | *11 | -- |
| Arsenic, total (µg/L as As) | 11.00 | 2.00 | 4.67 | 2.23 | -- | 15 | -- |
| Arsenic, dissolved (µg/L as As) | 10.00 | 1.00 | 3.59 | 2.09 | -- | *35 | -- |
| Barium, total (µg/L as Ba) | 300.00 | 100.00 | 150.00 | 75.59 | -- | *15 | -- |
| Barium, dissolved (µg/L as Ba) | 150.00 | 40.00 | 79.91 | 26.73 | -- | *35 | -- |
| Beryllium, total (µg/L as Be) | <10.00 | -- | -- | -- | -- | 4 | -- |
| Beryllium, dissolved (µg/L as Be) | 1.00 | .50 | .82 | .22 | -- | *24 | -- |
| Boron, total (µg/L as B) | 180.00 | 110.00 | 147.50 | 29.86 | -- | 4 | -- |
| Boron, dissolved (µg/L as B) | 250.00 | 120.00 | 175.33 | 36.23 | -- | 15 | -- |
| Cadmium, total (µg/L as Cd) | 27.00 | 1.00 | 14.00 | 18.38 | -- | *15 | -- |
| Cadmium, dissolved (µg/L as Cd) | 27.00 | 1.00 | 5.50 | 10.54 | -- | *35 | -- |
| Chromium, total (µg/L as Cr) | 20.00 | 10.00 | 13.33 | 5.77 | -- | *10 | -- |
| Chromium, dissolved (µg/L as Cr) | 10.00 | 10.00 | 10.00 | -- | -- | *35 | -- |
| Cobalt, dissolved (µg/L as Co) | 4.00 | 1.00 | 2.50 | 2.12 | -- | *30 | -- |
| Copper, dissolved (µg/L as Cu) | 22.00 | 1.00 | 3.27 | 3.94 | -- | *40 | -- |
| Cyanide, total (mg/L as CN) | <.01 | -- | -- | -- | .020 | 4 | 0 |
| Cyanide, dissolved (mg/L as CN) | <.01 | -- | -- | -- | -- | 12 | -- |
| Iron, total (µg/L as Fe) | 1,100.00 | 80.00 | 335.45 | 306.25 | -- | 11 | -- |
| Iron, dissolved (µg/L as Fe) | 190.00 | 7.00 | 31.17 | 34.66 | -- | *39 | -- |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | 12.00 | 1.00 | 3.86 | 3.06 | -- | *39 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Trace elements--Continued** | | | | | | | |
| Lithium, dissolved (µg/L as Li) | 81.00 | 30.00 | 51.59 | 15.35 | -- | 17 | -- |
| Manganese, dissolved (µg/L as Mn) | 3,300.00 | 3.00 | 368.12 | 625.38 | -- | 40 | -- |
| Mercury, dissolved (µg/L as Hg) | .60 | .10 | .26 | .16 | -- | *39 | -- |
| Molybdenum, dissolved (µg/L as Mo) | 20.00 | 20.00 | 20.00 | -- | -- | *17 | -- |
| Nickel, total (µg/L as Ni) | 45.00 | 2.00 | 8.42 | 11.67 | -- | 12 | -- |
| Nickel, dissolved (µg/L as Ni) | 6.00 | 1.00 | 3.11 | 1.64 | -- | *32 | -- |
| Selenium, total (µg/L as Se) | <1.00 | -- | -- | -- | -- | 15 | -- |
| Selenium, dissolved (µg/L as Se) | 1.00 | 1.00 | 1.00 | -- | -- | *40 | -- |
| Silver, total (µg/L as Ag) | 3.00 | 1.00 | 2.00 | 1.41 | -- | *18 | -- |
| Silver, dissolved (µg/L as Ag) | 1.00 | 1.00 | 1.00 | -- | -- | *34 | -- |
| Strontium, dissolved (µg/L as Sr) | 490.00 | 160.00 | 284.71 | 83.00 | -- | 17 | -- |
| Thallium, total (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 4 | -- |
| Thallium, dissolved (µg/L as Tl) | <1.00 | -- | -- | -- | -- | 12 | -- |
| Vanadium, dissolved (µg/L as V) | <6.00 | -- | -- | -- | -- | 17 | -- |
| Zinc, dissolved (µg/L as Zn) | 150.00 | 3.00 | 17.45 | 25.21 | -- | *40 | -- |
| **Pesticides** | | | | | | | |
| PCB, total (µg/L) | <.10 | -- | -- | -- | .001 | 6 | NC |
| PCB, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Alachlor, total, recoverable (µg/L) | <.10 | -- | -- | -- | -- | 2 | -- |
| Aldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Aldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Ametryne, total (µg/L) | <0.10 | -- | -- | -- | -- | 5 | -- |
| Atrazine, total (µg/L) | .10 | 0.10 | 0.10 | -- | -- | *5 | -- |
| Chlordane, total (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Chlordane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Cyanazine, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| DDD, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDD, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDE, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDE, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDT, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DDT, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| DEF, total (µg/L) | <.01 | -- | -- | -- | -- | 1 | -- |
| Diazinon, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Diazinon, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Dieldrin, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Dieldrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Disyston, total (µg/L) | <.01 | -- | -- | -- | -- | 3 | -- |
| Endosulfan, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Endosulfan, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Endrin, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Endrin, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Ethion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Ethion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| Guthion, total (µg/L) | <0.10 | -- | -- | -- | -- | 6 | -- |
| Heptachlor, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Heptachlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Heptachlor epoxide, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Heptachlor epoxide, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Lindane, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Lindane, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Malathion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Malathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methomyl, total (µg/L) | <2.00 | -- | -- | -- | -- | 6 | -- |
| Methoxychlor, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methoxychlor, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Methyl trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Metolachlor, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 2 | -- |
| Metribuzine, water, whole, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 2 | -- |
| Mirex, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Mirex, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| PCN, total (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Pesticides--Continued** | | | | | | | |
| PCN, dissolved (µg/L) | <0.10 | -- | -- | -- | -- | 6 | -- |
| Parathion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Parathion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Perthane, total (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Perthane, dissolved (µg/L) | <.10 | -- | -- | -- | -- | 6 | -- |
| Phorate, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Prometone, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| Prometryne, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| Propazine, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| Propham, total (µg/L) | <2.00 | -- | -- | -- | -- | 6 | -- |
| Sevin, total (µg/L) | <2.00 | -- | -- | -- | -- | 6 | -- |
| Silvex, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Simazine, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| Simetryne, total (µg/L) | <.10 | -- | -- | -- | -- | 5 | -- |
| Toxaphene, total (µg/L) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Toxaphene, dissolved (µg/L) | <1.00 | -- | -- | -- | -- | 6 | -- |
| Trifluralin, total recoverable (µg/L) | <.10 | -- | -- | -- | -- | 3 | -- |
| Trithion, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| Trithion, dissolved (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| 2,4-D, total (µg/L) | .07 | 0.02 | 0.04 | 0.02 | -- | *6 | -- |
| 2,4-DP, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |
| 2,4,5-T, total (µg/L) | <.01 | -- | -- | -- | -- | 6 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Chlorophyll data** | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | -- | -- | -- | -- | 0 | -- |
| **Sediment data** | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | 0 | -- |

Table 20.--Summary of water-quality data for station 06471000, James River at Columbia, South Dakota, April 13, 1979, to November 4, 1987--Continued

| Water-quality characteristic or constituent | Descriptive statistics | | | | South Dakota standard | Total number of measurements | Number of measurements exceeding South Dakota standard |
|---|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean | Standard deviation | | | |
| **Sediment data--Continued** | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 99.00 | 27.00 | 77.49 | 19.80 | -- | 35 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | 0 | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | 95.00 | 73.00 | 80.67 | 9.29 | -- | 9 | -- |
| Sediment, suspended concentration (mg/L) | 286.00 | 8.00 | 85.85 | 74.68 | -- | 46 | -- |
| Sediment discharge, tons per day | 140.00 | .11 | 17.19 | 28.58 | -- | 46 | -- |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations

[Data from U.S. Geological Survey; Kensal, James River gaging station above Arrowwood Lake near Kensal, N.Dak.; Pingree, James River gaging station near Pingree, N.Dak.; Reservoir, Jamestown Reservoir near Jamestown, N.Dak.; Jamestown, James River gaging station at Jamestown, N.Dak.; LaMoure, James River gaging station at LaMoure, N.Dak.; Meas., number of measurements; $ft^3/s$, cubic feet per second; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; Oakes, James River gaging station at Oakes, N.Dak.; Ludden, James River gaging station at the Dakota Lake Dam near Ludden, N.Dak.; State Line, James River gaging station at the North Dakota-South Dakota State Line; Hecla, James River gaging station near Hecla, S.Dak.; Columbia, James River gaging station at Columbia, S.Dak.; NTU, nephelometric turbidity units; mg/L, milligrams per liter; µg/L, micrograms per liter; mm, millimeters; -- indicates no value]

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties** | | | | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | | | | | | | | | | |
| March-May | 7 | 325.57 | 2 | 395.00 | 0 | -- | 27 | 180.34 | 28 | 683.21 |
| June-September | 7 | 7.10 | 2 | 13.25 | 0 | -- | 24 | 140.46 | 31 | 171.30 |
| October-February | 5 | 1.44 | 3 | 2.00 | 0 | -- | 35 | 36.80 | 36 | 48.27 |
| Specific conductance, field (µS/cm at 25 °C) | | | | | | | | | | |
| March-May | 7 | 563.14 | 15 | 595.00 | 52 | 576.38 | 27 | 589.07 | 30 | 592.33 |
| June-September | 7 | 875.71 | 17 | 635.88 | 76 | 570.58 | 24 | 645.83 | 51 | 688.92 |
| October-February | 6 | 1,216.67 | 16 | 806.87 | 122 | 604.78 | 35 | 894.26 | 38 | 1,048.29 |
| pH, field (units) | | | | | | | | | | |
| March-May | 3 | 8.07 | 14 | 8.26 | 52 | 8.39 | 10 | 8.02 | 20 | 8.03 |
| June-September | 7 | 8.41 | 17 | 8.48 | 74 | 8.11 | 14 | 8.06 | 30 | 8.25 |
| October-February | 6 | 7.83 | 16 | 8.37 | 116 | 8.12 | 13 | 7.91 | 32 | 8.09 |
| Temperature, water (°C) | | | | | | | | | | |
| March-May | 7 | 5.71 | 15 | 7.20 | 54 | 10.65 | 27 | 5.65 | 30 | 7.18 |
| June-September | 8 | 19.12 | 17 | 20.00 | 76 | 21.53 | 24 | 19.46 | 51 | 19.67 |
| October-February | 6 | 2.67 | 17 | 4.74 | 132 | 5.43 | 35 | 3.04 | 37 | 2.32 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties--Continued** | | | | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | | | | | | | | | | |
| March-May | 4 | 402.00 | 17 | 544.47 | 2 | 345.00 | 7 | 449.29 | 37 | 506.65 |
| June-September | 6 | 583.67 | 15 | 167.05 | 3 | 204.00 | 5 | 137.20 | 37 | 147.30 |
| October-February | 6 | 97.00 | 20 | 55.46 | 0 | -- | 10 | 79.16 | 29 | 68.11 |
| Specific conductance, field (µS/cm at 25 °C) | | | | | | | | | | |
| March-May | 10 | 612.00 | 17 | 599.06 | 11 | 988.64 | 8 | 622.50 | 35 | 691.00 |
| June-September | 19 | 710.53 | 29 | 736.21 | 13 | 758.85 | 5 | 762.00 | 39 | 745.90 |
| October-February | 15 | 1,161.33 | 19 | 1,088.42 | 10 | 985.10 | 10 | 1,069.00 | 26 | 1,131.35 |
| pH, field (units) | | | | | | | | | | |
| March-May | 10 | 8.17 | 10 | 8.40 | 9 | 7.97 | 6 | 8.40 | 19 | 7.97 |
| June-September | 10 | 8.29 | 11 | 8.43 | 10 | 8.46 | 5 | 8.40 | 33 | 7.77 |
| October-February | 15 | 8.28 | 18 | 8.45 | 10 | 8.31 | 10 | 8.43 | 24 | 7.70 |
| Temperature, water (°C) | | | | | | | | | | |
| March-May | 10 | 9.80 | 17 | 6.53 | 11 | 7.23 | 8 | 9.37 | 38 | 8.74 |
| June-September | 20 | 18.32 | 31 | 19.37 | 13 | 21.08 | 6 | 20.83 | 40 | 19.25 |
| October-February | 15 | 2.93 | 20 | 2.95 | 10 | 3.95 | 11 | 2.18 | 28 | 2.18 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties--Continued** | | | | | | | | | | |
| Turbidity (NTU) | | | | | | | | | | |
| March-May | 2 | 3.25 | 6 | 12.35 | 0 | -- | 6 | 7.43 | 6 | 19.55 |
| June-September | 7 | 12.34 | 5 | 19.40 | 0 | -- | 8 | 13.34 | 6 | 28.67 |
| October-February | 6 | 5.10 | 6 | 19.37 | 0 | -- | 10 | 6.33 | 8 | 4.55 |
| Oxygen, dissolved (mg/L) | | | | | | | | | | |
| March-May | 4 | 10.22 | 11 | 11.38 | 52 | 11.18 | 6 | 12.27 | 17 | 9.76 |
| June-September | 7 | 6.97 | 12 | 8.76 | 74 | 6.70 | 7 | 8.54 | 26 | 7.46 |
| October-February | 4 | 5.80 | 11 | 10.78 | 126 | 9.40 | 9 | 10.16 | 24 | 13.02 |
| Hardness, total (mg/L as $CaCO_3$) | | | | | | | | | | |
| March-May | 2 | 245.00 | 15 | 191.93 | 7 | 192.86 | 11 | 204.55 | 20 | 237.85 |
| June-September | 7 | 267.14 | 15 | 210.67 | 11 | 187.27 | 15 | 234.67 | 26 | 238.08 |
| October-February | 6 | 383.33 | 17 | 267.65 | 17 | 213.53 | 13 | 330.77 | 29 | 366.21 |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | | | | | | | | | | |
| March-May | 2 | 446.50 | 15 | 382.07 | 7 | 362.14 | 11 | 368.55 | 20 | 431.45 |
| June-September | 7 | 587.00 | 15 | 411.93 | 11 | 352.36 | 15 | 433.53 | 26 | 466.92 |
| October-February | 6 | 798.00 | 17 | 531.82 | 18 | 398.67 | 12 | 594.08 | 29 | 694.79 |
| Dissolved solids, sum of constituents (mg/L) | | | | | | | | | | |
| March-May | 2 | 440.50 | 15 | 355.47 | 7 | 350.14 | 11 | 351.00 | 20 | 419.05 |
| June-September | 7 | 550.29 | 15 | 389.00 | 11 | 346.45 | 15 | 418.47 | 26 | 445.08 |
| October-February | 6 | 662.17 | 17 | 497.41 | 17 | 371.29 | 13 | 578.77 | 29 | 679.62 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties--Continued** | | | | | | | | | | |
| Turbidity (NTU) | | | | | | | | | | |
| March-May | 5 | 32.60 | 7 | 19.91 | 0 | -- | 6 | 16.97 | 16 | 5.36 |
| June-September | 5 | 34.80 | 4 | 28.25 | 0 | -- | 4 | 22.50 | 18 | 3.65 |
| October-February | 8 | 8.49 | 10 | 6.37 | 0 | -- | 10 | 5.39 | 25 | 7.65 |
| Oxygen, dissolved (mg/L) | | | | | | | | | | |
| March-May | 9 | 10.40 | 11 | 11.61 | 6 | 11.25 | 7 | 12.54 | 14 | 9.98 |
| June-September | 11 | 8.35 | 12 | 7.91 | 7 | 7.46 | 5 | 7.70 | 27 | 5.82 |
| October-February | 10 | 16.64 | 16 | 15.01 | 9 | 15.08 | 8 | 11.50 | 18 | 8.92 |
| Hardness, total (mg/L as $CaCO_3$) | | | | | | | | | | |
| March-May | 8 | 232.50 | 11 | 220.91 | 8 | 474.37 | 6 | 233.33 | 17 | 275.88 |
| June-September | 9 | 233.33 | 11 | 227.27 | 10 | 250.00 | 4 | 270.00 | 17 | 252.94 |
| October-February | 13 | 435.38 | 17 | 384.71 | 10 | 393.00 | 10 | 361.00 | 25 | 392.80 |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | | | | | | | | | | |
| March-May | 5 | 419.40 | 7 | 420.86 | 8 | 823.87 | 6 | 429.50 | 17 | 495.76 |
| June-September | 5 | 480.20 | 4 | 448.00 | 10 | 514.10 | 4 | 479.50 | 18 | 485.50 |
| October-February | 8 | 784.50 | 11 | 692.00 | 10 | 703.30 | 10 | 695.80 | 25 | 726.60 |
| Dissolved solids, sum of constituents (mg/L) | | | | | | | | | | |
| March-May | 8 | 411.87 | 11 | 403.27 | 8 | 803.37 | 6 | 421.17 | 17 | 479.76 |
| June-September | 9 | 406.56 | 11 | 395.36 | 10 | 507.90 | 4 | 470.25 | 17 | 468.82 |
| October-February | 13 | 902.92 | 17 | 718.65 | 10 | 692.90 | 10 | 685.20 | 25 | 702.04 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents** | | | | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | | | | | | | | | | |
| March-May | 2 | 48.00 | 15 | 34.40 | 7 | 39.14 | 11 | 45.36 | 20 | 54.85 |
| June-September | 7 | 45.29 | 15 | 37.87 | 11 | 37.64 | 15 | 51.47 | 26 | 52.92 |
| October-February | 6 | 69.17 | 17 | 47.47 | 17 | 42.88 | 13 | 76.92 | 29 | 85.48 |
| Magnesium, dissolved (mg/L as Mg) | | | | | | | | | | |
| March-May | 2 | 30.00 | 15 | 25.93 | 7 | 23.29 | 11 | 22.45 | 20 | 24.38 |
| June-September | 7 | 37.86 | 15 | 28.00 | 11 | 22.73 | 15 | 25.73 | 26 | 25.73 |
| October-February | 6 | 51.33 | 17 | 36.18 | 17 | 26.00 | 13 | 33.92 | 29 | 37.31 |
| Sodium, dissolved (mg/L as Na) | | | | | | | | | | |
| March-May | 2 | 54.00 | 15 | 51.07 | 7 | 45.00 | 11 | 40.64 | 20 | 51.38 |
| June-September | 7 | 89.00 | 15 | 52.87 | 11 | 45.00 | 15 | 55.73 | 26 | 62.00 |
| October-February | 6 | 133.00 | 17 | 68.29 | 17 | 49.76 | 13 | 78.77 | 29 | 97.21 |
| Sodium-adsorption ratio (SAR) | | | | | | | | | | |
| March-May | 2 | 2.00 | 15 | 1.52 | 7 | 1.57 | 11 | 1.12 | 20 | 1.44 |
| June-September | 7 | 2.43 | 15 | 1.73 | 11 | 1.45 | 15 | 1.53 | 26 | 1.65 |
| October-February | 6 | 2.83 | 17 | 1.82 | 17 | 1.59 | 13 | 1.85 | 29 | 2.34 |
| Potassium, dissolved (mg/L as K) | | | | | | | | | | |
| March-May | 2 | 12.50 | 15 | 12.95 | 7 | 12.49 | 11 | 12.55 | 20 | 11.21 |
| June-September | 7 | 15.29 | 15 | 15.47 | 11 | 13.28 | 15 | 12.05 | 26 | 12.13 |
| October-February | 6 | 15.17 | 17 | 16.52 | 17 | 14.18 | 13 | 11.90 | 31 | 12.09 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents--Continued** | | | | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | | | | | | | | | | |
| March-May | 8 | 50.62 | 11 | 48.73 | 8 | 107.62 | 6 | 50.50 | 17 | 58.47 |
| June-September | 9 | 50.89 | 11 | 49.55 | 10 | 51.80 | 4 | 56.75 | 17 | 52.18 |
| October-February | 13 | 96.69 | 17 | 79.35 | 10 | 85.20 | 10 | 72.60 | 25 | 81.68 |
| Magnesium, dissolved (mg/L as Mg) | | | | | | | | | | |
| March-May | 8 | 25.87 | 11 | 24.18 | 8 | 50.76 | 6 | 25.83 | 16 | 32.25 |
| June-September | 9 | 25.56 | 11 | 25.36 | 10 | 29.30 | 4 | 30.25 | 17 | 29.76 |
| October-February | 13 | 47.38 | 17 | 45.18 | 10 | 43.20 | 10 | 43.50 | 25 | 45.80 |
| Sodium, dissolved (mg/L as Na) | | | | | | | | | | |
| March-May | 8 | 49.75 | 11 | 50.18 | 8 | 115.25 | 6 | 52.67 | 17 | 61.18 |
| June-September | 9 | 52.44 | 11 | 50.27 | 10 | 75.60 | 4 | 59.50 | 17 | 64.59 |
| October-February | 13 | 107.38 | 17 | 100.12 | 10 | 92.30 | 10 | 98.70 | 25 | 98.08 |
| Sodium-adsorption ratio (SAR) | | | | | | | | | | |
| March-May | 8 | 1.47 | 11 | 1.54 | 8 | 2.17 | 6 | 1.63 | 17 | 1.69 |
| June-September | 9 | 1.33 | 11 | 1.35 | 10 | 2.00 | 4 | 1.50 | 17 | 1.82 |
| October-February | 13 | 2.15 | 17 | 2.18 | 10 | 2.00 | 10 | 2.10 | 25 | 2.00 |
| Potassium, dissolved (mg/L as K) | | | | | | | | | | |
| March-May | 8 | 12.62 | 11 | 11.51 | 8 | 14.95 | 6 | 12.13 | 16 | 14.31 |
| June-September | 9 | 13.89 | 11 | 14.36 | 10 | 13.32 | 4 | 13.25 | 17 | 14.01 |
| October-February | 13 | 14.92 | 17 | 15.71 | 10 | 15.60 | 10 | 14.70 | 25 | 18.76 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents--Continued** | | | | | | | | | | |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | | | | | | | | | | |
| March-May | 2 | 251.50 | 12 | 208.08 | 5 | 210.00 | 8 | 197.87 | 14 | 201.79 |
| June-September | 7 | 307.43 | 13 | 225.92 | 9 | 209.11 | 10 | 217.40 | 18 | 238.83 |
| October-February | 3 | 411.00 | 14 | 265.50 | 12 | 233.83 | 9 | 297.22 | 23 | 325.96 |
| Sulfate, dissolved (mg/L as $SO_4$) | | | | | | | | | | |
| March-May | 2 | 115.00 | 15 | 100.00 | 7 | 91.14 | 11 | 107.36 | 20 | 118.85 |
| June-September | 7 | 141.43 | 15 | 102.27 | 11 | 85.64 | 15 | 122.00 | 26 | 120.69 |
| October-February | 6 | 208.33 | 17 | 129.24 | 18 | 97.72 | 13 | 174.38 | 31 | 181.65 |
| Chloride, dissolved (mg/L as Cl) | | | | | | | | | | |
| March-May | 2 | 13.50 | 15 | 10.70 | 7 | 10.21 | 11 | 12.62 | 20 | 21.71 |
| June-September | 7 | 19.29 | 15 | 10.90 | 11 | 10.89 | 15 | 16.88 | 26 | 26.13 |
| October-February | 6 | 35.33 | 17 | 16.25 | 18 | 11.07 | 13 | 31.16 | 31 | 37.70 |
| Fluoride, dissolved (mg/L as F) | | | | | | | | | | |
| March-May | 0 | -- | 12 | .13 | 7 | .14 | 5 | .12 | 18 | .16 |
| June-September | 0 | -- | 15 | .17 | 11 | .18 | 7 | .21 | 26 | .22 |
| October-February | 0 | -- | 17 | .20 | 18 | .24 | 3 | .20 | 31 | .26 |
| Silica, dissolved (mg/L as $SiO_2$) | | | | | | | | | | |
| March-May | 2 | 16.00 | 15 | 8.46 | 7 | 10.04 | 11 | 9.37 | 20 | 11.21 |
| June-September | 5 | 24.20 | 13 | 8.87 | 11 | 9.55 | 14 | 12.61 | 25 | 14.83 |
| October-February | 5 | 30.40 | 15 | 12.68 | 17 | 12.72 | 11 | 18.91 | 29 | 14.86 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents--Continued** | | | | | | | | | | |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | | | | | | | | | | |
| March-May | 8 | 215.12 | 11 | 194.91 | 2 | 265.00 | 6 | 200.67 | 12 | 245.58 |
| June-September | 8 | 224.00 | 10 | 215.20 | 3 | 260.00 | 4 | 230.00 | 13 | 276.38 |
| October-February | 13 | 391.46 | 16 | 342.37 | 3 | 250.00 | 10 | 317.70 | 19 | 391.63 |
| Sulfate, dissolved (mg/L as $SO_4$) | | | | | | | | | | |
| March-May | 8 | 114.87 | 11 | 119.82 | 8 | 260.12 | 6 | 127.83 | 17 | 131.94 |
| June-September | 9 | 109.00 | 11 | 112.27 | 10 | 150.80 | 4 | 141.25 | 18 | 101.50 |
| October-February | 13 | 230.62 | 17 | 210.24 | 10 | 200.90 | 10 | 199.50 | 25 | 178.92 |
| Chloride, dissolved (mg/L as Cl) | | | | | | | | | | |
| March-May | 8 | 18.00 | 11 | 21.82 | 8 | 57.31 | 6 | 22.33 | 16 | 28.00 |
| June-September | 9 | 19.33 | 11 | 16.08 | 10 | 35.90 | 4 | 21.75 | 18 | 24.56 |
| October-February | 13 | 51.46 | 17 | 43.71 | 10 | 41.30 | 10 | 42.90 | 25 | 41.32 |
| Fluoride, dissolved (mg/L as F) | | | | | | | | | | |
| March-May | 8 | .15 | 11 | .16 | 8 | .22 | 0 | -- | 15 | .18 |
| June-September | 9 | .21 | 11 | .19 | 10 | .25 | 0 | -- | 17 | .22 |
| October-February | 13 | .30 | 17 | .27 | 10 | .24 | 0 | -- | 20 | .28 |
| Silica, dissolved (mg/L as $SiO_2$) | | | | | | | | | | |
| March-May | 8 | 9.11 | 11 | 8.65 | 8 | 9.57 | 6 | 8.60 | 16 | 6.68 |
| June-September | 8 | 15.61 | 10 | 10.23 | 10 | 11.33 | 3 | 12.50 | 17 | 17.25 |
| October-February | 11 | 139.75 | 14 | 17.59 | 10 | 11.33 | 8 | 28.27 | 25 | 17.64 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Nutrients** | | | | | | | | | | |
| Nitrate, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 0 | -- | 1 | 0.51 | 0 | -- | 8 | 0.33 | 3 | 0.43 |
| June-September | 0 | -- | 0 | -- | 0 | -- | 8 | .18 | 1 | .13 |
| October-February | 1 | 0.07 | 0 | -- | 0 | -- | 7 | .25 | 3 | .21 |
| Nitrite, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 2 | .02 | 3 | .02 | 0 | -- | 5 | .06 | 4 | .04 |
| June-September | 0 | -- | 1 | .03 | 0 | -- | 4 | .02 | 1 | .02 |
| October-February | 2 | .03 | 0 | -- | 0 | -- | 5 | .02 | 3 | .01 |
| Nitrogen, ammonia, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| June-September | 2 | .03 | 1 | .01 | 1 | 0.37 | 1 | .06 | 1 | .28 |
| October-February | 1 | .02 | 2 | .02 | 0 | -- | 2 | .11 | 1 | .21 |
| Phosphorus, dissolved (mg/L as P) | | | | | | | | | | |
| March-May | 2 | .09 | 14 | .09 | 7 | .08 | 6 | .11 | 19 | .14 |
| June-September | 7 | .09 | 15 | .06 | 10 | .11 | 8 | .06 | 28 | .18 |
| October-February | 6 | .08 | 17 | .07 | 17 | .10 | 10 | .07 | 28 | .11 |
| Phosphate, ortho, dissolved (mg/L as P) | | | | | | | | | | |
| March-May | 2 | .07 | 4 | .06 | 0 | -- | 4 | .12 | 4 | .10 |
| June-September | 5 | .07 | 4 | .05 | 0 | -- | 5 | .06 | 5 | .12 |
| October-February | 5 | .07 | 5 | .02 | 0 | -- | 7 | .10 | 5 | .12 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Nutrients--Continued** | | | | | | | | | | |
| Nitrate, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 4 | 0.40 | 3 | 0.41 | 0 | -- | 2 | 0.40 | 1 | 0.09 |
| June-September | 2 | .26 | 1 | .25 | 1 | 0.06 | 0 | -- | 0 | -- |
| October-February | 0 | -- | 3 | .14 | 0 | -- | 1 | .17 | 4 | .66 |
| Nitrite, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 4 | .02 | 4 | .02 | 0 | -- | 2 | .02 | 1 | .01 |
| June-September | 3 | .03 | 2 | .07 | 1 | .01 | 0 | -- | 1 | .03 |
| October-February | 0 | -- | 2 | .02 | 0 | -- | 1 | .04 | 6 | .02 |
| Nitrogen, ammonia, dissolved (mg/L as N) | | | | | | | | | | |
| March-May | 8 | .16 | 11 | .14 | 0 | -- | 0 | -- | 15 | .20 |
| June-September | 9 | .10 | 10 | .12 | 1 | .09 | 1 | .14 | 12 | .26 |
| October-February | 13 | .05 | 15 | .29 | 0 | -- | 1 | .01 | 19 | .31 |
| Phosphorus, dissolved (mg/L as P) | | | | | | | | | | |
| March-May | 8 | .11 | 11 | .07 | 8 | .14 | 6 | .07 | 17 | .20 |
| June-September | 9 | .10 | 11 | .05 | 10 | .21 | 4 | .63 | 17 | .31 |
| October-February | 12 | .07 | 15 | .12 | 10 | .12 | 9 | .10 | 25 | .18 |
| Phosphate, ortho, dissolved (mg/L as P) | | | | | | | | | | |
| March-May | 8 | .08 | 10 | .05 | 0 | -- | 4 | .06 | 11 | .15 |
| June-September | 9 | .08 | 10 | .04 | 1 | .28 | 3 | .06 | 11 | .31 |
| October-February | 12 | .10 | 14 | .09 | 0 | -- | 5 | .10 | 15 | .15 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Trace elements** | | | | | | | | | | |
| Arsenic, dissolved (µg/L as As) | | | | | | | | | | |
| March-May | 2 | 2.50 | 10 | 1.80 | 1 | 2.00 | 7 | 1.86 | 5 | 2.00 |
| June-September | 6 | 5.17 | 11 | 3.45 | 0 | -- | 8 | 2.75 | 4 | 3.50 |
| October-February | 5 | 2.20 | 9 | 2.89 | 0 | -- | 6 | 2.67 | 6 | 2.50 |
| Barium, dissolved (µg/L as Ba) | | | | | | | | | | |
| March-May | 2 | 67.00 | 9 | 63.78 | 0 | -- | 4 | 52.00 | 5 | 49.40 |
| June-September | 4 | 71.50 | 10 | 85.30 | 0 | -- | 4 | 68.25 | 3 | 73.00 |
| October-February | 4 | 100.75 | 7 | 95.29 | 0 | -- | 4 | 72.75 | 4 | 71.25 |
| Boron, dissolved (µg/L as B) | | | | | | | | | | |
| March-May | 2 | 115.00 | 14 | 92.14 | 7 | 101.43 | 11 | 146.36 | 20 | 149.00 |
| June-September | 7 | 198.57 | 15 | 121.33 | 9 | 95.56 | 15 | 198.67 | 27 | 195.56 |
| October-February | 6 | 216.67 | 17 | 152.35 | 18 | 117.78 | 13 | 225.38 | 29 | 279.66 |
| Copper, dissolved (µg/L as Cu) | | | | | | | | | | |
| March-May | 1 | 2.00 | 9 | 2.11 | 0 | -- | 4 | 2.50 | 6 | 2.83 |
| June-September | 5 | 2.00 | 8 | 1.50 | 0 | -- | 6 | 2.50 | 4 | 1.75 |
| October-February | 2 | 2.00 | 6 | .83 | 0 | -- | 5 | 1.60 | 8 | 1.37 |
| Iron, dissolved (µg/L as Fe) | | | | | | | | | | |
| March-May | 2 | 22.00 | 10 | 51.40 | 1 | 30.00 | 10 | 78.80 | 7 | 35.71 |
| June-September | 7 | 14.86 | 9 | 46.00 | 0 | -- | 15 | 24.00 | 5 | 7.80 |
| October-February | 6 | 30.50 | 6 | 15.83 | 0 | -- | 13 | 47.54 | 9 | 11.78 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Trace elements--Continued** | | | | | | | | | | |
| Arsenic, dissolved (µg/L as As) | | | | | | | | | | |
| March-May | 3 | 2.67 | 4 | 2.25 | 1 | 2.00 | 4 | 2.25 | 11 | 2.45 |
| June-September | 4 | 3.50 | 4 | 3.25 | 0 | -- | 3 | 3.00 | 9 | 4.44 |
| October-February | 6 | 2.83 | 5 | 3.40 | 0 | -- | 6 | 2.83 | 14 | 3.93 |
| Barium, dissolved (µg/L as Ba) | | | | | | | | | | |
| March-May | 3 | 55.67 | 5 | 55.80 | 1 | 30.00 | 4 | 57.00 | 11 | 74.09 |
| June-September | 3 | 79.33 | 3 | 81.67 | 0 | -- | 2 | 73.50 | 9 | 66.89 |
| October-February | 4 | 72.00 | 4 | 86.00 | 0 | -- | 4 | 85.75 | 14 | 92.86 |
| Boron, dissolved (µg/L as B) | | | | | | | | | | |
| March-May | 8 | 120.00 | 11 | 498.18 | 8 | 306.25 | 6 | 131.67 | 3 | 153.33 |
| June-September | 9 | 153.33 | 11 | 139.09 | 10 | 240.00 | 4 | 160.00 | 5 | 160.00 |
| October-February | 13 | 295.38 | 17 | 232.35 | 10 | 256.00 | 10 | 226.00 | 7 | 195.71 |
| Copper, dissolved (µg/L as Cu) | | | | | | | | | | |
| March-May | 4 | 2.00 | 6 | 1.83 | 0 | -- | 5 | 2.20 | 11 | 4.73 |
| June-September | 3 | 1.67 | 1 | 1.00 | 0 | -- | 1 | 2.00 | 6 | 2.50 |
| October-February | 7 | 1.71 | 9 | 1.33 | 0 | -- | 9 | 1.56 | 13 | 2.38 |
| Iron, dissolved (µg/L as Fe) | | | | | | | | | | |
| March-May | 8 | 35.75 | 11 | 29.82 | 1 | 40.00 | 6 | 19.50 | 12 | 32.92 |
| June-September | 9 | 16.33 | 11 | 12.73 | 0 | -- | 4 | 6.00 | 9 | 32.00 |
| October-February | 12 | 9.58 | 15 | 13.60 | 0 | -- | 9 | 11.89 | 15 | 29.27 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Trace elements--Continued** | | | | | | | | | | |
| Lead, dissolved (µg/L as Pb) | | | | | | | | | | |
| March-May | 0 | -- | 6 | 2.17 | 0 | -- | 5 | 1.60 | 1 | 4.00 |
| June-September | 2 | 1.50 | 5 | 2.00 | 0 | -- | 4 | .25 | 1 | 3.00 |
| October-February | 1 | 1.00 | 4 | .25 | 0 | -- | 3 | 2.33 | 2 | 1.50 |
| Manganese, dissolved (µg/L as Mn) | | | | | | | | | | |
| March-May | 2 | 79.50 | 12 | 279.92 | 1 | 260.00 | 11 | 530.00 | 7 | 301.43 |
| June-September | 7 | 112.43 | 12 | 144.08 | 0 | -- | 15 | 466.07 | 6 | 445.67 |
| October-February | 6 | 384.17 | 10 | 675.40 | 0 | -- | 13 | 824.62 | 9 | 415.67 |
| Mercury, dissolved (µg/L as Hg) | | | | | | | | | | |
| March-May | 2 | .20 | 10 | .28 | 0 | -- | 9 | .52 | 6 | .32 |
| June-September | 7 | .36 | 9 | .68 | 0 | -- | 10 | .93 | 6 | .32 |
| October-February | 5 | .28 | 9 | .11 | 0 | -- | 9 | .26 | 9 | .16 |
| Zinc, dissolved (µg/L as Zn) | | | | | | | | | | |
| March-May | 1 | 8.00 | 9 | 11.56 | 0 | -- | 6 | 7.17 | 7 | 14.29 |
| June-September | 6 | 6.33 | 9 | 6.78 | 0 | -- | 8 | 7.12 | 4 | 12.75 |
| October-February | 5 | 7.40 | 5 | 7.20 | 0 | -- | 6 | 11.33 | 8 | 10.25 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Trace elements--Continued** | | | | | | | | | | |
| Lead, dissolved (µg/L as Pb) | | | | | | | | | | |
| March-May | 3 | 2.67 | 3 | 2.67 | 0 | -- | 2 | 3.00 | 5 | 6.80 |
| June-September | 1 | 1.00 | 0 | -- | 0 | -- | 1 | 2.00 | 4 | 2.50 |
| October-February | 2 | 6.50 | 2 | 5.50 | 0 | -- | 2 | 3.50 | 5 | 2.00 |
| Manganese, dissolved (µg/L as Mn) | | | | | | | | | | |
| March-May | 7 | 239.86 | 11 | 50.45 | 0 | -- | 6 | 36.00 | 12 | 418.50 |
| June-September | 9 | 167.22 | 11 | 29.27 | 0 | -- | 4 | 14.25 | 11 | 237.55 |
| October-February | 13 | 76.23 | 16 | 401.75 | 0 | -- | 9 | 46.00 | 17 | 417.06 |
| Mercury, dissolved (µg/L as Hg) | | | | | | | | | | |
| March-May | 3 | .27 | 5 | .18 | 0 | -- | 6 | .30 | 2 | .30 |
| June-September | 3 | .27 | 4 | .17 | 0 | -- | 3 | .37 | 3 | .17 |
| October-February | 8 | .21 | 9 | .21 | 0 | -- | 10 | .29 | 3 | .33 |
| Zinc, dissolved (µg/L as Zn) | | | | | | | | | | |
| March-May | 4 | 12.00 | 6 | 6.33 | 0 | -- | 5 | 10.60 | 10 | 27.10 |
| June-September | 5 | 11.20 | 4 | 8.25 | 0 | -- | 2 | 19.50 | 9 | 13.22 |
| October-February | 5 | 15.20 | 8 | 10.25 | 0 | -- | 7 | 16.14 | 14 | 13.29 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Kensal | | Pingree | | Reservoir | | Jamestown | | LaMoure | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Sediment data** | | | | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | | | | | | | | | | |
| March-May | 4 | 95.00 | 4 | 92.00 | 0 | -- | 4 | 90.75 | 5 | 97.80 |
| June-September | 6 | 93.83 | 5 | 98.20 | 0 | -- | 6 | 96.17 | 4 | 99.00 |
| October-February | 5 | 79.60 | 3 | 64.00 | 0 | -- | 4 | 59.25 | 6 | 55.17 |
| Sediment, suspended concentration (mg/L) | | | | | | | | | | |
| March-May | 4 | 12.50 | 5 | 21.20 | 0 | -- | 5 | 26.60 | 12 | 82.58 |
| June-September | 7 | 32.71 | 6 | 43.33 | 0 | -- | 8 | 36.12 | 22 | 67.00 |
| October-February | 5 | 72.00 | 4 | 41.25 | 0 | -- | 6 | 41.83 | 22 | 34.32 |
| Sediment discharge, tons per day | | | | | | | | | | |
| March-May | 4 | 8.15 | 5 | 2.64 | 0 | -- | 5 | 13.91 | 12 | 318.27 |
| June-September | 7 | .65 | 6 | .90 | 0 | -- | 8 | 9.30 | 22 | 29.84 |
| October-February | 5 | .34 | 4 | 1.63 | 0 | -- | 6 | 1.67 | 22 | 5.01 |

Table 21.--Seasonal means of selected water-quality characteristics and constituents of samples from U.S. Geological Survey gaging stations--Continued

| Water-quality characteristic or constituent | Oakes | | Ludden | | State Line | | Hecla | | Columbia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Sediment data--Continued** | | | | | | | | | | |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | | | | | | | | | | |
| March-May | 5 | 91.80 | 6 | 96.17 | 0 | -- | 3 | 95.00 | 12 | 75.17 |
| June-September | 3 | 99.00 | 4 | 99.50 | 0 | -- | 4 | 98.75 | 12 | 80.67 |
| October-February | 4 | 49.00 | 6 | 68.83 | 0 | -- | 1 | 94.00 | 11 | 76.55 |
| Sediment, suspended concentration (mg/L) | | | | | | | | | | |
| March-May | 4 | 161.00 | 7 | 56.29 | 0 | -- | 6 | 40.50 | 14 | 55.57 |
| June-September | 3 | 98.00 | 4 | 58.00 | 0 | -- | 5 | 68.20 | 12 | 37.67 |
| October-February | 4 | 70.25 | 7 | 42.57 | 0 | -- | 5 | 34.00 | 20 | 135.95 |
| Sediment discharge, tons per day | | | | | | | | | | |
| March-May | 4 | 59.50 | 7 | 82.00 | 0 | -- | 6 | 44.67 | 14 | 33.18 |
| June-September | 3 | 45.33 | 4 | 19.47 | 0 | -- | 5 | 29.86 | 12 | 14.68 |
| October-February | 4 | 9.47 | 7 | 4.59 | 0 | -- | 5 | 5.28 | 20 | 7.49 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas

[Data from U.S. Bureau of Reclamation; Arrowwood Refuge, Arrowwood National Wildlife Refuge, N.Dak.; Hyatt Slough, Hyatt Slough State Wildlife Management Area, N.Dak.; Sand Lake Ref., Mud Lake pool, Mud Lake pool, Sand Lake National Wildlife Refuge, S.Dak.; Sand Lake Ref., Sand Lake pool, Sand Lake pool, Sand Lake National Wildlife Refuge, S.Dak.; Meas., number of measurements; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; µg/L, micrograms per liter; -- indicates no value]

| Water-quality characteristic or constituent | Arrowwood Refuge | | Hyatt Slough | | Sand Lake Ref. Mud Lake pool | | Sand Lake Ref. Sand Lake pool | |
|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties** | | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | | | | | | | | |
| April-May | 12 | 309.17 | 2 | 1,365.00 | 3 | 453.33 | 5 | 406.00 |
| June-July | 195 | 763.59 | 19 | 1,328.95 | 75 | 925.60 | 57 | 745.96 |
| August-September | 193 | 809.90 | 18 | 1,392.22 | 78 | 891.41 | 56 | 790.89 |
| Specific conductance, laboratory (µS/cm at 25 °C) | | | | | | | | |
| April-May | 12 | 372.50 | 2 | 1,390.00 | 5 | 440.00 | 6 | 421.67 |
| June-July | 188 | 765.80 | 19 | 1,313.16 | 75 | 788.53 | 57 | 735.61 |
| August-September | 203 | 793.40 | 18 | 1,351.11 | 78 | 912.31 | 56 | 798.57 |
| pH, field (units) | | | | | | | | |
| April-May | 12 | 7.92 | 2 | 8.25 | 3 | 8.11 | 5 | 8.17 |
| June-July | 195 | 8.27 | 19 | 9.10 | 75 | 8.32 | 57 | 8.54 |
| August-September | 193 | 8.37 | 18 | 8.75 | 78 | 8.23 | 56 | 8.41 |
| Oxidation reduction potential (mV) | | | | | | | | |
| April-May | 3 | .16 | 2 | .11 | 3 | .15 | 5 | .14 |
| June-July | 180 | .13 | 19 | .12 | 75 | .13 | 57 | .11 |
| August-September | 193 | .16 | 18 | .10 | 78 | .18 | 56 | .15 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| | | | Physical properties--Continued | | | | | |
| Temperature, water (°C) | | | | | | | | |
| April-May | 12 | 12.25 | 2 | 13.60 | 3 | 11.50 | 5 | 10.00 |
| June-July | 186 | 21.83 | 19 | 23.65 | 68 | 22.28 | 54 | 22.18 |
| August-September | 192 | 17.88 | 18 | 16.14 | 78 | 14.93 | 56 | 15.83 |
| Turbidity (NTU) | | | | | | | | |
| April-May | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| June-July | 131 | 54.20 | 9 | 13.89 | 39 | 45.79 | 28 | 32.07 |
| August-September | 126 | 68.25 | 12 | 24.75 | 52 | 49.60 | 39 | 45.56 |
| Transparency, secchi disk (in.) | | | | | | | | |
| April-May | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| June-July | 160 | .57 | 17 | 1.10 | 75 | .42 | 44 | .70 |
| August-September | 185 | .32 | 18 | .88 | 78 | .32 | 55 | .53 |
| Oxygen, dissolved (mg/L) | | | | | | | | |
| April-May | 12 | 9.98 | 2 | 8.39 | 3 | 9.66 | 5 | 10.98 |
| June-July | 195 | 7.91 | 19 | 10.19 | 75 | 7.57 | 54 | 7.60 |
| August-September | 193 | 8.26 | 18 | 8.83 | 78 | 9.32 | 56 | 8.92 |
| Dissolved solids, sum of constituents (mg/L) | | | | | | | | |
| April-May | 12 | 207.26 | 2 | 848.65 | 5 | 253.36 | 6 | 232.47 |
| June-July | 188 | 459.58 | 19 | 858.57 | 75 | 472.70 | 57 | 440.21 |
| August-September | 203 | 486.29 | 18 | 873.36 | 77 | 550.08 | 56 | 467.11 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| **Physical properties--Continued** | | | | | | | | |
| Suspended solids, inorganic (mg/L) | | | | | | | | |
| April-May | 12 | 8.17 | 2 | 5.50 | 4 | 17.12 | 6 | 10.04 |
| June-July | 149 | 32.93 | 14 | 3.63 | 61 | 20.42 | 47 | 6.90 |
| August-September | 139 | 39.16 | 12 | 18.43 | 52 | 29.10 | 38 | 21.67 |
| Suspended solids, organic (mg/L) | | | | | | | | |
| April-May | 12 | 9.29 | 2 | 11.25 | 4 | 8.71 | 6 | 9.62 |
| June-July | 149 | 13.79 | 16 | 12.16 | 61 | 12.98 | 48 | 7.38 |
| August-September | 139 | 20.05 | 12 | 17.36 | 52 | 17.88 | 38 | 24.20 |
| **Major constituents** | | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | | | | | | | | |
| April-May | 12 | 27.32 | 2 | 63.25 | 5 | 37.84 | 6 | 34.10 |
| June-July | 188 | 45.09 | 19 | 59.69 | 75 | 48.17 | 57 | 45.35 |
| August-September | 203 | 38.99 | 18 | 61.17 | 78 | 55.69 | 56 | 42.68 |
| Magnesium, dissolved (mg/L as Mg) | | | | | | | | |
| April-May | 12 | 16.41 | 2 | 66.55 | 5 | 16.72 | 6 | 15.95 |
| June-July | 188 | 33.54 | 19 | 61.54 | 75 | 30.88 | 57 | 29.78 |
| August-September | 203 | 34.66 | 18 | 61.29 | 78 | 35.04 | 56 | 31.31 |
| Sodium, dissolved (mg/L as Na) | | | | | | | | |
| April-May | 12 | 23.10 | 2 | 140.80 | 5 | 27.72 | 6 | 26.03 |
| June-July | 188 | 68.08 | 19 | 142.13 | 75 | 72.69 | 57 | 68.59 |
| August-September | 203 | 80.60 | 18 | 143.98 | 78 | 84.49 | 56 | 78.20 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| | | | Major constituents--Continued | | | | | |
| Sodium-adsorption ratio (SAR) | | | | | | | | |
| April-May | 12 | 0.86 | 2 | 2.95 | 5 | 0.94 | 6 | 0.92 |
| June-July | 188 | 1.87 | 19 | 3.08 | 75 | 2.02 | 57 | 1.96 |
| August-September | 203 | 2.27 | 18 | 3.13 | 78 | 2.19 | 56 | 2.21 |
| Potassium, dissolved (mg/L as K) | | | | | | | | |
| April-May | 12 | 8.96 | 2 | 44.71 | 5 | 11.57 | 6 | 11.77 |
| June-July | 188 | 15.91 | 19 | 44.32 | 75 | 14.43 | 57 | 14.05 |
| August-September | 203 | 16.59 | 18 | 46.68 | 78 | 15.26 | 56 | 15.16 |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | | | | | | | | |
| April-May | 12 | 158.76 | 2 | 477.81 | 5 | 176.40 | 6 | 167.17 |
| June-July | 188 | 303.84 | 19 | 318.57 | 75 | 267.59 | 57 | 256.41 |
| August-September | 203 | 314.10 | 18 | 365.15 | 77 | 333.66 | 56 | 294.60 |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | | | | | | | | |
| April-May | 12 | 2.10 | 2 | 0 | 5 | 0 | 6 | 0 |
| June-July | 188 | 8.52 | 19 | 76.08 | 75 | 9.42 | 57 | 18.37 |
| August-September | 203 | 10.87 | 18 | 58.38 | 77 | 3.37 | 56 | 16.73 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| **Major constituents--Continued** | | | | | | | | |
| Sulfate, dissolved (mg/L as $SO_4$) | | | | | | | | |
| April-May | 12 | 45.28 | 2 | 209.08 | 5 | 59.11 | 6 | 49.30 |
| June-July | 188 | 125.80 | 19 | 230.69 | 75 | 140.70 | 57 | 112.70 |
| August-September | 203 | 135.19 | 18 | 235.44 | 78 | 160.20 | 56 | 109.08 |
| Chloride, dissolved (mg/L as Cl) | | | | | | | | |
| April-May | 12 | 5.69 | 2 | 88.16 | 5 | 13.33 | 6 | 12.87 |
| June-July | 188 | 12.43 | 19 | 86.36 | 75 | 24.13 | 57 | 24.45 |
| August-September | 203 | 14.21 | 18 | 85.05 | 78 | 30.55 | 56 | 27.94 |
| **Nutrients** | | | | | | | | |
| Nitrate, dissolved (mg/L as N) | | | | | | | | |
| April-May | 12 | .15 | 2 | 0 | 5 | .06 | 6 | .01 |
| June-July | 199 | .03 | 19 | .01 | 74 | .02 | 57 | .01 |
| August-September | 197 | .02 | 18 | .03 | 77 | .01 | 52 | .17 |
| Nitrite, dissolved (mg/L as N) | | | | | | | | |
| April-May | 12 | 0 | 2 | 0 | 5 | 0 | 6 | 0 |
| June-July | 202 | .01 | 19 | .00 | 76 | 0 | 58 | 0 |
| August-September | 203 | .01 | 18 | .02 | 78 | 0 | 56 | .05 |
| Nitrogen, ammonia, dissolved (mg/L as N) | | | | | | | | |
| April-May | 12 | .04 | 2 | .05 | 5 | .06 | 6 | .06 |
| June-July | 188 | .37 | 19 | .29 | 76 | .28 | 58 | .36 |
| August-September | 203 | .33 | 18 | .78 | 78 | .24 | 56 | .39 |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| | Nutrients--Continued | | | | | | | |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | | | | | | | | |
| April-May | 12 | 0.99 | 2 | 2.42 | 5 | 0.95 | 6 | 1.20 |
| June-July | 202 | 2.25 | 19 | 2.34 | 76 | 2.05 | 58 | 2.27 |
| August-September | 203 | 2.67 | 18 | 3.43 | 78 | 2.45 | 56 | 2.54 |
| Phosphorus, total (mg/L as P) | | | | | | | | |
| April-May | 12 | .02 | 2 | .80 | 5 | .06 | 6 | .05 |
| June-July | 202 | .25 | 19 | .65 | 76 | .32 | 58 | .36 |
| August-September | 203 | .27 | 18 | .92 | 78 | .27 | 56 | .46 |
| Phosphate, ortho, dissolved (mg/L as P) | | | | | | | | |
| April-May | 12 | 0 | 2 | .67 | 5 | .05 | 6 | .03 |
| June-July | 202 | .10 | 19 | .52 | 76 | .17 | 58 | .24 |
| August-September | 203 | .10 | 18 | .67 | 78 | .08 | 56 | .29 |
| Carbon, organic, total (mg/L as C) | | | | | | | | |
| April-May | 12 | 10.91 | 0 | -- | 2 | 15.50 | 5 | 15.20 |
| June-July | 24 | 13.87 | 0 | -- | 4 | 15.37 | 9 | 13.89 |
| August-September | 12 | 21.92 | 0 | -- | 0 | -- | 0 | -- |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge Meas. | Arrowwood Refuge Mean | Hyatt Slough Meas. | Hyatt Slough Mean | Sand Lake Ref. Mud Lake pool Meas. | Sand Lake Ref. Mud Lake pool Mean | Sand Lake Ref. Sand Lake pool Meas. | Sand Lake Ref. Sand Lake pool Mean |
|---|---|---|---|---|---|---|---|---|
| | | | | Trace elements | | | | |
| Arsenic, dissolved (µg/L as As) | | | | | | | | |
| April-May | 7 | 1.86 | 0 | -- | 5 | 1.84 | 6 | 2.12 |
| June-July | 25 | 3.50 | 4 | 6.20 | 10 | 4.99 | 11 | 4.37 |
| August-September | 12 | 5.27 | 0 | -- | 0 | -- | 0 | -- |
| Cadmium, dissolved (µg/L as Cd) | | | | | | | | |
| April-May | 12 | .30 | 0 | -- | 4 | .28 | 5 | .26 |
| June-July | 0 | -- | 2 | .35 | 0 | -- | 0 | -- |
| August-September | 1 | .21 | 0 | -- | 0 | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | | | | | | | | |
| April-May | 12 | 2.07 | 0 | -- | 5 | 1.52 | 2 | 1.40 |
| June-July | 11 | 1.88 | 2 | 2.65 | 10 | 1.89 | 11 | 1.85 |
| August-September | 12 | 3.63 | 0 | -- | 0 | -- | 0 | -- |

Table 22.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from U.S. Bureau of Reclamation data-collection areas--Continued

| Water-quality characteristic or constituent | Arrowwood Refuge | | Hyatt Slough | | Sand Lake Ref. Mud Lake pool | | Sand Lake Ref. Sand Lake pool | |
|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Chlorophyll data** | | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | | | | | | | | |
| April-May | 12 | 57.46 | 2 | 54.98 | 5 | 65.95 | 6 | 66.60 |
| June-July | 90 | 40.50 | 10 | 53.51 | 36 | 51.07 | 29 | 23.76 |
| August-September | 76 | 90.65 | 6 | 5.88 | 26 | 85.07 | 20 | 47.67 |
| Chlorophyll-B, phytoplankton (µg/L) | | | | | | | | |
| April-May | 12 | .08 | 2 | 1.53 | 5 | 0 | 6 | .12 |
| June-July | 90 | 1.75 | 10 | .26 | 36 | 2.81 | 29 | 1.02 |
| August-September | 76 | 2.18 | 6 | .90 | 26 | 4.22 | 20 | 1.95 |
| Chlorophyll-C, phytoplankton (µg/L) | | | | | | | | |
| April-May | 12 | 10.62 | 2 | 8.09 | 5 | 10.05 | 6 | 11.50 |
| June-July | 90 | 2.62 | 10 | 3.41 | 36 | 2.74 | 29 | 1.28 |
| August-September | 76 | 5.09 | 6 | 1.18 | 26 | 4.24 | 20 | 2.50 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota

[Data from U.S. Bureau of Reclamation; all Arrowwood locations; Arrowwood Lake pool, Mud Lake pool, Jim Lake pool, Depuy Marsh pool, Meas., number of measurements; µs/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; µg/L, micrograms per liter; -- indicates no value]

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties** | | | | | | | | | | |
| Specific conductance, field (µS/cm at 25 °C) | | | | | | | | | | |
| April-May | 12 | 309.17 | 4 | 340.00 | 4 | 275.00 | 1 | 320.00 | 3 | 310.00 |
| June-July | 195 | 763.59 | 49 | 744.90 | 64 | 794.53 | 51 | 754.12 | 19 | 712.63 |
| August-September | 193 | 809.90 | 49 | 775.51 | 57 | 863.33 | 59 | 776.95 | 15 | 849.33 |
| Specific conductance, laboratory (µS/cm at 25 °C) | | | | | | | | | | |
| April-May | 12 | 372.50 | 4 | 422.50 | 4 | 352.50 | 1 | 350.00 | 3 | 340.00 |
| June-July | 188 | 765.80 | 48 | 741.04 | 58 | 794.83 | 52 | 759.42 | 19 | 738.95 |
| August-September | 203 | 793.40 | 51 | 756.47 | 62 | 836.94 | 61 | 768.52 | 15 | 822.67 |
| pH, field (units) | | | | | | | | | | |
| April-May | 12 | 7.92 | 4 | 7.37 | 4 | 7.92 | 1 | 8.51 | 3 | 8.45 |
| June-July | 195 | 8.27 | 49 | 8.48 | 64 | 8.19 | 51 | 8.27 | 19 | 7.75 |
| August-September | 193 | 8.37 | 49 | 8.59 | 57 | 8.30 | 59 | 8.29 | 15 | 8.09 |
| Oxidation reduction potential (mV) | | | | | | | | | | |
| April-May | 3 | .16 | 0 | -- | 0 | -- | 1 | .16 | 2 | .16 |
| June-July | 180 | .13 | 47 | .12 | 56 | .14 | 51 | .14 | 15 | .14 |
| August-September | 193 | .16 | 49 | .15 | 57 | .16 | 59 | .16 | 15 | .16 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties--Continued** | | | | | | | | | | |
| Temperature, water (°C) | | | | | | | | | | |
| April-May | 12 | 12.25 | 4 | 12.70 | 4 | 11.97 | 1 | 11.50 | 3 | 12.27 |
| June-July | 186 | 21.83 | 49 | 21.16 | 60 | 21.66 | 49 | 22.38 | 17 | 22.75 |
| August-September | 192 | 17.88 | 49 | 17.69 | 57 | 17.43 | 59 | 17.93 | 15 | 20.31 |
| Turbidity (NTU) | | | | | | | | | | |
| April-May | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| June-July | 131 | 54.20 | 32 | 64.91 | 40 | 50.37 | 40 | 56.95 | 11 | 31.36 |
| August-September | 126 | 68.25 | 32 | 68.31 | 40 | 73.00 | 40 | 71.97 | 6 | 36.17 |
| Transparency, secchi disk (in.) | | | | | | | | | | |
| April-May | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| June-July | 160 | .57 | 40 | .68 | 48 | .49 | 48 | .60 | 13 | .63 |
| August-September | 185 | .32 | 45 | .31 | 57 | .35 | 58 | .29 | 12 | .39 |
| Oxygen, dissolved (mg/L) | | | | | | | | | | |
| April-May | 12 | 9.98 | 4 | 9.73 | 4 | 8.67 | 1 | 11.71 | 3 | 11.47 |
| June-July | 195 | 7.91 | 49 | 7.99 | 64 | 7.91 | 51 | 7.93 | 19 | 7.07 |
| August-September | 193 | 8.26 | 49 | 7.67 | 57 | 8.38 | 59 | 8.70 | 15 | 8.21 |
| Dissolved solids, sum of constituents (mg/L) | | | | | | | | | | |
| April-May | 12 | 207.26 | 4 | 237.03 | 4 | 197.94 | 1 | 189.73 | 3 | 185.85 |
| June-July | 188 | 459.58 | 48 | 451.20 | 58 | 475.71 | 52 | 455.79 | 19 | 425.41 |
| August-September | 203 | 486.29 | 51 | 469.34 | 62 | 511.43 | 61 | 466.75 | 15 | 507.25 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Physical properties--Continued** | | | | | | | | | | |
| Suspended solids, inorganic (mg/L) | | | | | | | | | | |
| April-May | 12 | 8.17 | 4 | 7.87 | 4 | 6.62 | 1 | 7.00 | 3 | 11.00 |
| June-July | 149 | 32.93 | 37 | 22.88 | 45 | 23.25 | 42 | 50.23 | 17 | 36.87 |
| August-September | 139 | 39.16 | 36 | 33.66 | 44 | 41.28 | 41 | 44.14 | 11 | 33.95 |
| Suspended solids, organic (mg/L) | | | | | | | | | | |
| April-May | 12 | 9.29 | 4 | 9.37 | 4 | 8.00 | 1 | 9.00 | 3 | 11.00 |
| June-July | 149 | 13.79 | 37 | 13.63 | 45 | 13.16 | 42 | 15.65 | 17 | 10.85 |
| August-September | 139 | 20.05 | 36 | 17.97 | 44 | 22.39 | 41 | 19.35 | 11 | 24.94 |
| **Major constituents** | | | | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | | | | | | | | | | |
| April-May | 12 | 27.32 | 4 | 30.80 | 4 | 25.57 | 1 | 26.40 | 3 | 25.30 |
| June-July | 188 | 45.09 | 48 | 41.07 | 58 | 48.97 | 52 | 44.57 | 19 | 46.20 |
| August-September | 203 | 38.99 | 51 | 32.98 | 62 | 43.01 | 61 | 38.86 | 15 | 46.35 |
| Magnesium, dissolved (mg/L as Mg) | | | | | | | | | | |
| April-May | 12 | 16.41 | 4 | 19.52 | 4 | 15.68 | 1 | 15.40 | 3 | 13.57 |
| June-July | 188 | 33.54 | 48 | 33.48 | 58 | 34.50 | 52 | 32.89 | 19 | 31.61 |
| August-September | 203 | 34.66 | 51 | 33.54 | 62 | 36.30 | 61 | 33.04 | 15 | 37.55 |
| Sodium, dissolved (mg/L as Na) | | | | | | | | | | |
| April-May | 12 | 23.10 | 4 | 25.30 | 4 | 23.65 | 1 | 19.80 | 3 | 20.53 |
| June-July | 188 | 68.08 | 48 | 67.33 | 58 | 70.91 | 52 | 66.40 | 19 | 60.50 |
| August-September | 203 | 80.60 | 51 | 80.89 | 62 | 86.51 | 61 | 73.03 | 15 | 79.27 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents--Continued** | | | | | | | | | | |
| Sodium-adsorption ratio (SAR) | | | | | | | | | | |
| April-May | 12 | 0.86 | 4 | 0.88 | 4 | 0.91 | 1 | 0.76 | 3 | 0.82 |
| June-July | 188 | 1.87 | 48 | 1.89 | 58 | 1.89 | 52 | 1.85 | 19 | 1.65 |
| August-September | 203 | 2.27 | 51 | 2.38 | 62 | 2.33 | 61 | 2.10 | 15 | 2.08 |
| Potassium, dissolved (mg/L as K) | | | | | | | | | | |
| April-May | 12 | 8.96 | 4 | 9.62 | 4 | 8.47 | 1 | 8.58 | 3 | 8.87 |
| June-July | 188 | 15.91 | 48 | 15.72 | 58 | 15.97 | 52 | 16.42 | 19 | 14.90 |
| August-September | 203 | 16.59 | 51 | 16.52 | 62 | 16.20 | 61 | 17.16 | 15 | 16.07 |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | | | | | | | | | | |
| April-May | 12 | 158.76 | 4 | 179.93 | 4 | 157.25 | 1 | 136.46 | 3 | 139.98 |
| June-July | 188 | 303.84 | 48 | 269.74 | 58 | 336.18 | 52 | 298.44 | 19 | 316.82 |
| August-September | 203 | 314.10 | 51 | 263.08 | 62 | 364.33 | 61 | 297.99 | 15 | 354.25 |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | | | | | | | | | | |
| April-May | 12 | 2.10 | 4 | 2.45 | 4 | 0 | 1 | 5.60 | 3 | 3.27 |
| June-July | 188 | 8.52 | 48 | 17.10 | 58 | 4.76 | 52 | 5.17 | 19 | 1.24 |
| August-September | 203 | 10.87 | 51 | 23.02 | 62 | 5.17 | 61 | 6.33 | 15 | 6.77 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Major constituents--Continued** | | | | | | | | | | |
| Sulfate, dissolved (mg/L as $SO_4$) | | | | | | | | | | |
| April-May | 12 | 45.28 | 4 | 53.23 | 4 | 41.70 | 1 | 40.91 | 3 | 40.91 |
| June-July | 188 | 125.80 | 48 | 130.84 | 58 | 121.77 | 52 | 130.20 | 19 | 103.47 |
| August-September | 203 | 135.19 | 51 | 137.68 | 62 | 129.76 | 61 | 137.60 | 15 | 132.61 |
| Chloride, dissolved (mg/L as Cl) | | | | | | | | | | |
| April-May | 12 | 5.69 | 4 | 7.40 | 4 | 5.32 | 1 | 4.25 | 3 | 4.39 |
| June-July | 188 | 12.43 | 48 | 12.26 | 58 | 12.70 | 52 | 12.57 | 19 | 10.96 |
| August-September | 203 | 14.21 | 51 | 14.59 | 62 | 14.67 | 61 | 13.37 | 15 | 13.81 |
| **Nutrients** | | | | | | | | | | |
| Nitrate, dissolved (mg/L as N) | | | | | | | | | | |
| April-May | 12 | .15 | 4 | .01 | 4 | .03 | 1 | 1.53 | 3 | .02 |
| June-July | 199 | .03 | 50 | .02 | 63 | .06 | 52 | .02 | 22 | .03 |
| August-September | 197 | .02 | 49 | .04 | 59 | 0 | 60 | .02 | 15 | 0 |
| Nitrite, dissolved (mg/L as N) | | | | | | | | | | |
| April-May | 12 | 0 | 4 | 0 | 4 | 0 | 1 | 0 | 3 | 0 |
| June-July | 202 | .01 | 50 | .01 | 66 | 0 | 52 | .01 | 22 | .01 |
| August-September | 203 | .01 | 51 | .02 | 62 | .01 | 61 | .02 | 15 | 0 |
| Nitrogen, ammonia, dissolved (mg/L as N) | | | | | | | | | | |
| April-May | 12 | .04 | 4 | .05 | 4 | .05 | 1 | .03 | 3 | .03 |
| June-July | 188 | .37 | 48 | .38 | 58 | .33 | 52 | .46 | 19 | .27 |
| August-September | 203 | .33 | 51 | .38 | 62 | .21 | 61 | .46 | 15 | .23 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Nutrients--Continued** | | | | | | | | | | |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | | | | | | | | | | |
| April-May | 12 | 0.99 | 4 | 1.18 | 4 | 1.07 | 1 | 0.45 | 3 | 0.80 |
| June-July | 202 | 2.25 | 50 | 2.38 | 66 | 2.31 | 52 | 2.25 | 22 | 1.58 |
| August-September | 203 | 2.67 | 51 | 2.95 | 62 | 2.55 | 61 | 2.68 | 15 | 1.94 |
| Phosphorus, total (mg/L as P) | | | | | | | | | | |
| April-May | 12 | .02 | 4 | .02 | 4 | .02 | 1 | .02 | 3 | .04 |
| June-July | 202 | .25 | 50 | .25 | 66 | .27 | 52 | .22 | 22 | .24 |
| August-September | 203 | .27 | 51 | .29 | 62 | .33 | 61 | .21 | 15 | .20 |
| Phosphate, ortho, dissolved (mg/L as P) | | | | | | | | | | |
| April-May | 12 | 0 | 4 | 0 | 4 | 0 | 1 | 0 | 3 | 0 |
| June-July | 202 | .10 | 50 | .11 | 66 | .12 | 52 | .05 | 22 | .13 |
| August-September | 203 | .10 | 51 | .10 | 62 | .12 | 61 | .06 | 15 | .08 |
| Carbon, organic, total (mg/L as C) | | | | | | | | | | |
| April-May | 12 | 10.91 | 4 | 10.74 | 4 | 11.00 | 1 | 10.00 | 3 | 11.33 |
| June-July | 24 | 13.87 | 8 | 15.12 | 8 | 13.50 | 2 | 12.50 | 6 | 13.17 |
| August-September | 12 | 21.92 | 4 | 22.25 | 4 | 22.25 | 1 | 18.00 | 3 | 22.33 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Trace elements** | | | | | | | | | | |
| Arsenic, dissolved (µg/L as As) | | | | | | | | | | |
| April-May | 7 | 1.86 | 2 | 1.80 | 4 | 1.65 | 0 | -- | 1 | 2.80 |
| June-July | 25 | 3.50 | 8 | 4.72 | 8 | 3.25 | 2 | 2.30 | 7 | 2.73 |
| August-September | 12 | 5.27 | 4 | 5.40 | 4 | 5.87 | 1 | 4.80 | 3 | 4.43 |
| Cadmium, dissolved (µg/L as Cd) | | | | | | | | | | |
| April-May | 12 | .30 | 4 | .30 | 4 | .32 | 1 | .29 | 3 | .26 |
| June-July | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- |
| August-September | 1 | .21 | 1 | .21 | 0 | -- | 0 | -- | 0 | -- |
| Lead, dissolved (µg/L as Pb) | | | | | | | | | | |
| April-May | 12 | 2.07 | 4 | 1.70 | 4 | 2.45 | 1 | 2.20 | 3 | 2.03 |
| June-July | 11 | 1.88 | 6 | 1.78 | 1 | 1.30 | 1 | 1.10 | 3 | 2.53 |
| August-September | 12 | 3.63 | 4 | 4.26 | 4 | 4.12 | 1 | 2.50 | 3 | 2.50 |

Table 23.--Bimonthly (summer) means of selected water-quality characteristics and constituents of samples from areas within the Arrowwood National Wildlife Refuge, North Dakota--Continued

| Water-quality characteristic or constituent | All Arrowwood locations | | Arrowwood Lake pool | | Mud Lake pool | | Jim Lake pool | | Depuy Marsh pool | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean | Meas. | Mean |
| **Chlorophyll data** | | | | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | | | | | | | | | | |
| April-May | 12 | 57.46 | 4 | 50.61 | 4 | 47.04 | 1 | 68.01 | 3 | 76.94 |
| June-July | 90 | 40.50 | 24 | 39.52 | 28 | 31.85 | 22 | 48.91 | 12 | 57.24 |
| August-September | 76 | 90.65 | 20 | 150.16 | 24 | 53.02 | 21 | 61.13 | 7 | 116.06 |
| Chlorophyll-B, phytoplankton (µg/L) | | | | | | | | | | |
| April-May | 12 | .08 | 4 | 0 | 4 | .24 | 1 | 0 | 3 | 0 |
| June-July | 90 | 1.75 | 24 | .72 | 28 | 1.74 | 22 | 2.13 | 12 | 3.64 |
| August-September | 76 | 2.18 | 20 | .37 | 24 | 2.53 | 21 | 1.22 | 7 | 9.50 |
| Chlorophyll-C, phytoplankton (µg/L) | | | | | | | | | | |
| April-May | 12 | 10.62 | 4 | 9.03 | 4 | 9.51 | 1 | 12.61 | 3 | 13.54 |
| June-July | 90 | 2.62 | 24 | 3.32 | 28 | 2.20 | 22 | 2.09 | 12 | 3.94 |
| August-September | 76 | 5.09 | 20 | 6.18 | 24 | 4.31 | 21 | 3.45 | 7 | 9.34 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits

[KEN, James River gaging station above Arrowwood Lake near Kensal, N.Dak.; AWD REF, Arrowwood National Wildlife Refuge, N.Dak.; AWD LAK, Arrowwood Lake pool, Arrowwood National Wildlife Refuge, N.Dak.; AWD MUD, Mud lake pool, Arrowwood National Wildlife Refuge, N.Dak.; AWD JIM, Jim Lake pool, Arrowwood National Wildlife Refuge, N.Dak.; AWD DEP, Depuy Marsh pool, Arrowwood National Wildlife Refuge, N.Dak.; PIN, James River gaging station near Pingree, N.Dak.; RES, Jamestown Reservoir near Jamestown, N.Dak.; JAM, James River gaging station at Jamestown, N.Dak.; LAM, James River gaging station at LaMoure, N.Dak.; OAK, James River gaging station at Oakes, N.Dak.; HYT, Hyatt Slough State Wildlife Management Area, N.Dak.; LUD, James River gaging station at the Dakota Lake Dam near Ludden, N.Dak.; LIN, James River gaging station at the North Dakota-South Dakota State line; HEC, James River gaging station near Hecla, S.Dak.; MUD, Mud Lake pool, Sand Lake National Wildlife Refuge, S.Dak.; SAN, Sand Lake pool, Sand Lake National Wildlife Refuge, S.Dak.; COL, James River gaging station at Columbia, S.Dak.; number in parenthesis is map location number in figure 1; $ft^3/s$, cubic feet per second; µs/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mV, millivolts; °C, degrees Celsius; NTU, nephelometric turbidity units; in., inches; mg/L, milligrams per liter; meq/L, milliequivalents per liter; pCi/L, picocuries per liter; µg/L, micrograms per liter; mm, millimeters; -- indicates no measurement]

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Physical properties** | | | | | | | | | | | | | | | | | | |
| Discharge, instantaneous, stream ($ft^3/s$) | 19 | -- | -- | -- | -- | -- | 7 | -- | 86 | 95 | 16 | -- | 52 | 5 | 22 | -- | -- | 103 |
| Specific conductance, field (µS/cm at 25 °C) | 20 | 400 | 102 | 125 | 111 | 37 | 48 | 250 | 86 | 119 | 44 | 39 | 65 | 34 | 23 | 156 | 118 | 100 |
| Specific conductance, laboratory (µS/cm at 25 °C) | 15 | 403 | 103 | 124 | 114 | 37 | 39 | 28 | 22 | 55 | 30 | 39 | 38 | 7 | 20 | 158 | 119 | 44 |
| pH, field (units) | 16 | 400 | 102 | 125 | 111 | 37 | 47 | 242 | 37 | 82 | 35 | 39 | 39 | 29 | 21 | 156 | 118 | 76 |
| pH, laboratory (units) | 15 | 37 | 12 | 13 | 3 | 9 | 39 | 28 | 30 | 56 | 30 | 6 | 39 | 8 | 20 | 15 | 17 | 44 |
| Oxidation reduction potential (mV) | -- | 376 | 96 | 113 | 111 | 32 | -- | -- | -- | -- | -- | 39 | -- | -- | -- | 156 | 118 | -- |
| Temperature, water (°C) | 21 | 390 | 102 | 121 | 109 | 35 | 49 | 262 | 86 | 118 | 45 | 39 | 68 | 34 | 25 | 149 | 115 | 106 |
| Color (platinum-cobalt units) | -- | -- | -- | -- | -- | -- | 44 | 34 | -- | 75 | -- | -- | -- | 27 | -- | -- | -- | -- |
| Turbidity (NTU) | 15 | 257 | 64 | 80 | 80 | 17 | 17 | -- | 24 | 20 | 18 | 21 | 21 | -- | 20 | 91 | 67 | 59 |
| Turbidity, at mid-depth (NTU) | 0 | 36 | 12 | 12 | 3 | 9 | -- | -- | -- | -- | -- | 6 | -- | -- | -- | 15 | 17 | -- |
| Transparency, secchi disk (in.) | -- | 345 | 85 | 105 | 106 | 25 | -- | 31 | 0 | -- | -- | 35 | -- | -- | -- | 153 | 99 | -- |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Physical properties--Continued** | | | | | | | | | | | | | | | | | | |
| Oxygen, dissolved (mg/L) | 15 | 400 | 102 | 125 | 111 | 37 | 34 | 252 | 22 | 67 | 30 | 39 | 39 | 22 | 20 | 156 | 115 | 59 |
| Oxygen, dissolved, percent saturation (percent) | 15 | -- | -- | -- | -- | -- | 31 | 128 | 22 | 55 | 24 | -- | 34 | 14 | 20 | -- | -- | 22 |
| Oxygen demand, biochemical 5-day at 20 °C (mg/L) | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 | 1 | 5 | -- | 8 | -- | 1 | -- | -- | -- |
| Hardness, total (mg/L as $CaCO_3$) | 15 | -- | -- | -- | -- | -- | 47 | 35 | 39 | 75 | 30 | -- | 39 | 28 | 20 | -- | -- | 59 |
| Hardness, noncarbonate, field (mg/L as $CaCO_3$) | 21 | -- | -- | -- | -- | -- | 49 | 263 | 86 | 121 | 55 | -- | 68 | 34 | 25 | -- | -- | 122 |
| Acidity, total, heated (mg/L as $H^+$) | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dissolved solids, residue on evaporation at 180 °C (mg/L) | 15 | -- | -- | -- | -- | -- | 47 | 36 | 38 | 75 | 18 | -- | 22 | 28 | 20 | -- | -- | 60 |
| Dissolved solids, sum of constituents (mg/L) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 157 | 119 | 59 |
| Dissolved solids, tons per acre-foot | 15 | -- | -- | -- | -- | -- | 47 | 36 | 39 | 75 | 30 | -- | 39 | 28 | 20 | -- | -- | 60 |
| Dissolved solids, tons per day | 15 | -- | -- | -- | -- | -- | 47 | 35 | 39 | 75 | 30 | -- | 39 | 28 | 20 | -- | -- | 60 |
| Suspended solids, residue on evaporation at 105 °C (mg/L) | 15 | -- | -- | -- | -- | -- | 16 | -- | 23 | 21 | 29 | -- | 21 | -- | 20 | -- | -- | 16 |
| Suspended solids, inorganic (mg/L) | -- | 300 | 77 | 93 | 84 | 31 | -- | -- | -- | -- | -- | 28 | -- | -- | -- | 118 | 91 | -- |
| Suspended solids, organic (mg/L) | -- | 300 | 77 | 93 | 84 | 31 | -- | -- | -- | -- | -- | 30 | -- | -- | -- | 118 | 92 | -- |
| **Major constituents** | | | | | | | | | | | | | | | | | | |
| Calcium, dissolved (mg/L as Ca) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 59 |
| Magnesium, dissolved (mg/L as Mg) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 58 |
| Sodium, dissolved (mg/L as Na) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 59 |
| Sodium, percent of major cations: Ca + Mg + Na + K, (meq/L) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 59 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Major constituents--Continued | | | | | | | | | | | |
| Sodium-adsorption ratio (SAR) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 59 |
| Sodium + potassium, dissolved (mg/L as Na + K) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 75 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 58 |
| Potassium, dissolved (mg/L as K) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 35 | 39 | 77 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 58 |
| Potassium 40, dissolved (pCi/L) | -- | -- | -- | -- | -- | -- | 2 | 2 | -- | 5 | -- | -- | -- | 4 | -- | -- | -- | 2 |
| Bicarbonate, total, field (mg/L as $HCO_3$) | -- | -- | -- | -- | -- | -- | -- | 1 | 5 | 2 | -- | -- | -- | 1 | -- | -- | -- | -- |
| Bicarbonate, titration to pH 4.5, laboratory (mg/L as $HCO_3$) | -- | 403 | 103 | 124 | 114 | 37 | -- | -- | 11 | 1 | -- | 39 | 1 | -- | -- | 157 | 119 | -- |
| Carbonate, total, field (mg/L as $CO_3$) | -- | -- | -- | -- | -- | -- | -- | -- | 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Carbonate, titration to pH 8.3, laboratory (mg/L as $CO_3$) | -- | 403 | 103 | 124 | 114 | 37 | -- | -- | 11 | 1 | -- | 39 | 1 | -- | -- | 157 | 119 | -- |
| Alkalinity, total, field (mg/L as $CaCO_3$) | -- | -- | -- | -- | -- | -- | 8 | 9 | 5 | 23 | -- | -- | -- | 22 | 0 | -- | -- | 29 |
| Alkalinity, total, laboratory (mg/L as $CaCO_3$) | 5 | 47 | 16 | 16 | 4 | 11 | 4 | 1 | 4 | 5 | 5 | 4 | 7 | -- | 2 | 14 | 16 | 1 |
| Alkalinity, titration to pH 4.5, laboratory (mg/L as $CaCO_3$) | 12 | -- | -- | -- | -- | -- | 39 | 26 | 27 | 55 | 29 | -- | 37 | 8 | 20 | -- | -- | 44 |
| Carbon dioxide, dissolved (mg/L as $CO_2$) | -- | -- | -- | -- | -- | -- | -- | 2 | 14 | 3 | -- | -- | 1 | 1 | -- | -- | -- | 4 |
| Sulfate, dissolved (mg/L as $SO_4$) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 36 | 39 | 77 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 60 |
| Chloride, dissolved (mg/L as Cl) | 15 | 403 | 103 | 124 | 114 | 37 | 47 | 36 | 39 | 77 | 30 | 39 | 39 | 28 | 20 | 158 | 119 | 59 |
| Fluoride, total (mg/L as F) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- |
| Fluoride, dissolved (mg/L as F) | -- | -- | -- | -- | -- | -- | 44 | 36 | 15 | 75 | 30 | -- | 39 | 28 | -- | -- | -- | 52 |
| Silica, dissolved (mg/L as $SiO_2$) | 12 | -- | -- | -- | -- | 0 | 43 | 35 | 36 | 74 | 27 | -- | 35 | 28 | 17 | -- | -- | 58 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrients** | | | | | | | | | | | | | | | | | | |
| Nitrate, dissolved (mg/L as N) | 1 | 408 | 103 | 126 | 113 | 40 | 1 | -- | 23 | 7 | 6 | 39 | 7 | 1 | 3 | 156 | 115 | 5 |
| Nitrate, dissolved (mg/L as $NO_3$) | -- | -- | -- | -- | -- | -- | -- | -- | 11 | 2 | 2 | -- | 2 | 1 | -- | -- | -- | 1 |
| Nitrite, total (mg/L as N) | 3 | -- | -- | -- | -- | -- | 3 | -- | 6 | 4 | 3 | -- | 4 | -- | 4 | -- | -- | 2 |
| Nitrite, dissolved (mg/L as N) | 4 | 417 | 105 | 132 | 114 | 40 | 4 | -- | 14 | 8 | 7 | 39 | 8 | 1 | 3 | 159 | 120 | 8 |
| Nitrite, dissolved (mg/L as $NO_2$) | 4 | -- | -- | -- | -- | -- | 4 | -- | 14 | 8 | 7 | -- | 8 | 1 | 3 | -- | -- | 8 |
| Nitrite plus nitrate, total (mg/L as N) | 1 | -- | -- | -- | -- | -- | 1 | -- | 6 | 3 | 3 | -- | 3 | -- | 3 | -- | -- | 17 |
| Nitrite plus nitrate, dissolved (mg/L as N) | 1 | -- | -- | -- | -- | -- | 16 | 27 | 18 | 55 | 10 | -- | 8 | 26 | 4 | -- | -- | 31 |
| Nitrogen, ammonia, dissolved (mg/L as N) | 3 | 403 | 103 | 124 | 114 | 37 | 3 | 1 | 3 | 2 | 30 | 39 | 36 | 1 | 2 | 159 | 120 | 46 |
| Nitrogen, ammonia, dissolved (mg/L as $NH_4$) | 3 | -- | -- | -- | -- | -- | 3 | 1 | 3 | 2 | 30 | -- | 36 | 1 | 2 | -- | -- | 47 |
| Nitrogen, ammonia, un-ionized (calculated; mg/L as N) | 1 | 47 | 16 | 16 | 4 | 11 | -- | 1 | -- | 2 | 25 | 4 | 31 | 1 | -- | 14 | 16 | 45 |
| Nitrogen, ammonia, organic, dissolved (mg/L as N) | -- | 417 | 105 | 132 | 114 | 40 | -- | -- | -- | -- | -- | 39 | -- | -- | -- | 159 | 120 | -- |
| Phosphorus, total (mg/L as P) | 5 | 417 | 105 | 132 | 114 | 40 | 6 | -- | 5 | 7 | 4 | 39 | 6 | -- | 4 | 159 | 120 | 54 |
| Phosphorus, dissolved (mg/L as P) | 15 | -- | -- | -- | -- | -- | 46 | 34 | 24 | 75 | 29 | -- | 37 | 28 | 19 | -- | -- | 59 |
| Phosphate, ortho, total (mg/L as P) | 6 | -- | -- | -- | -- | -- | 6 | -- | 6 | 6 | 4 | -- | 6 | -- | 5 | -- | -- | 4 |
| Phosphate, ortho, dissolved (mg/L as P) | 12 | 417 | 105 | 132 | 114 | 40 | 13 | -- | 16 | 14 | 29 | 39 | 34 | 1 | 12 | 159 | 120 | 37 |
| Phosphate, ortho, dissolved (mg/L as $PO_4$) | 12 | -- | -- | -- | -- | -- | 13 | -- | 22 | 14 | 29 | -- | 34 | 1 | 12 | -- | -- | 37 |
| Carbon, organic, total (mg/L as C) | 1 | 48 | 16 | 16 | 4 | 12 | 1 | -- | 1 | 2 | 1 | -- | 1 | -- | 1 | 6 | 14 | 12 |
| **Trace elements** | | | | | | | | | | | | | | | | | | |
| Aluminum, dissolved (µg/L as Al) | -- | -- | -- | -- | -- | -- | 17 | 1 | -- | 1 | -- | 0 | -- | 0 | -- | -- | -- | 6 |
| Antimony, total (µg/L as Sb) | -- | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 1 | 0 | 1 | -- | 1 | -- | -- | 1 |
| Antimony, dissolved (µg/L as Sb) | -- | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 0 | 0 | 0 | -- | 0 | -- | -- | 1 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Trace elements--Continued** | | | | | | | | | | | | | | | | | | |
| Arsenic, total (µg/L as As) | 5 | -- | -- | -- | -- | -- | 6 | -- | 4 | 6 | 4 | -- | 6 | -- | 5 | -- | -- | 15 |
| Arsenic, dissolved (µg/L as As) | 13 | 44 | 14 | 16 | 3 | 11 | 30 | 1 | 21 | 15 | 13 | 4 | 13 | 1 | 13 | 15 | 17 | 34 |
| Barium, total (µg/L as Ba) | 4 | -- | -- | -- | -- | -- | 2 | -- | 5 | 6 | 2 | -- | 5 | -- | 4 | -- | -- | 8 |
| Barium, dissolved (µg/L as Ba) | 10 | -- | -- | -- | -- | -- | 26 | 0 | 12 | 12 | 10 | -- | 12 | 1 | 10 | -- | -- | 34 |
| Beryllium, total (µg/L as Be) | 0 | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 0 |
| Beryllium, dissolved (µg/L as Be) | 2 | -- | -- | -- | -- | -- | 1 | -- | 0 | 0 | 1 | -- | 1 | -- | 2 | -- | -- | 4 |
| Boron, total (µg/L as B) | 4 | -- | -- | -- | -- | -- | 4 | -- | 4 | 5 | 3 | -- | 5 | -- | 4 | -- | -- | 4 |
| Boron, dissolved (µg/L as B) | 15 | -- | -- | -- | -- | -- | 46 | 34 | 39 | 76 | 30 | -- | 39 | 28 | 20 | -- | -- | 15 |
| Cadmium, total (µg/L as Cd) | 0 | -- | -- | -- | -- | -- | 1 | -- | 0 | 1 | 3 | -- | 0 | -- | 0 | -- | -- | 2 |
| Cadmium, dissolved (µg/L as Cd) | 2 | 13 | 5 | 4 | 1 | 3 | 4 | 0 | 1 | 5 | 1 | 2 | 2 | 0 | 2 | 4 | 5 | 6 |
| Chromium, total (µg/L as Cr) | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | 1 | 1 | -- | 1 | -- | 1 | -- | -- | 3 |
| Chromium, dissolved (µg/L as Cr) | 0 | -- | -- | -- | -- | -- | 9 | 0 | 0 | 1 | 1 | -- | 0 | -- | 0 | -- | -- | 1 |
| Cobalt, dissolved (µg/L as Co) | 0 | -- | -- | -- | -- | -- | 3 | 1 | 0 | 0 | 0 | -- | 0 | 0 | 0 | -- | -- | 2 |
| Copper, dissolved (µg/L as Cu) | 8 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 15 | 18 | 14 | -- | 16 | 0 | 15 | -- | -- | 30 |
| Iron, total (µg/L as Fe) | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 | 2 | 1 | -- | 1 | -- | 1 | -- | -- | 11 |
| Iron, dissolved (µg/L as Fe) | 15 | -- | -- | -- | -- | -- | 25 | 1 | 38 | 21 | 29 | -- | 37 | 1 | 19 | -- | -- | 36 |
| Iron 59, dissolved (pCi/L as Fe) | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead, dissolved (µg/L as Pb) | 3 | 35 | 14 | 9 | 3 | 9 | 15 | 0 | 12 | 4 | 6 | 2 | 5 | 0 | 5 | 15 | 13 | 14 |
| Lithium, dissolved (µg/L as Li) | -- | -- | -- | -- | -- | -- | 19 | 1 | 6 | 1 | -- | -- | -- | 0 | -- | -- | -- | 17 |
| Manganese, dissolved (µg/L as Mn) | 15 | -- | -- | -- | -- | 0 | 34 | 1 | 39 | 22 | 29 | -- | 38 | 0 | 19 | -- | -- | 40 |
| Mercury, dissolved (µg/L as Hg) | 14 | 1 | 0 | 1 | 0 | 0 | 28 | 0 | 28 | 21 | 14 | 0 | 18 | 0 | 19 | 1 | 0 | 8 |
| Molybdenum, dissolved (µg/L as Mo) | -- | -- | -- | -- | -- | -- | 8 | 0 | 4 | 0 | -- | -- | -- | 0 | -- | -- | -- | 1 |
| Nickel, total (µg/L as Ni) | 3 | -- | -- | -- | -- | -- | 4 | -- | 4 | 6 | 4 | -- | 6 | 0 | 5 | -- | -- | 12 |
| Nickel, dissolved (µg/L as Ni) | 7 | -- | -- | -- | -- | -- | 22 | 1 | 11 | 9 | 8 | -- | 10 | -- | 8 | -- | -- | 28 |
| Selenium, total (µg/L as Se) | 0 | -- | -- | -- | -- | -- | 0 | -- | 1 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 0 |
| Selenium, dissolved (µg/L as Se) | 0 | 5 | 2 | 0 | 1 | 2 | 10 | 0 | 7 | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 1 | 1 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Trace elements--Continued** | | | | | | | | | | | | | | | | | | |
| Silver, total (µg/L as Ag) | 1 | -- | -- | -- | -- | -- | 0 | -- | 1 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 2 |
| Silver, dissolved (µg/L as Ag) | 0 | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 1 |
| Strontium, dissolved (µg/L as Sr) | -- | -- | -- | -- | -- | -- | 20 | 1 | 6 | 1 | 0 | -- | -- | 1 | -- | -- | -- | 17 |
| Thallium, total (µg/L as Tl) | 0 | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 0 |
| Thallium, dissolved (µg/L as Tl) | 0 | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 | 0 | -- | 0 | -- | 0 | -- | -- | 0 |
| Vanadium, dissolved (µg/L as V) | -- | -- | -- | -- | -- | -- | 15 | -- | -- | 1 | -- | -- | -- | 1 | -- | -- | -- | 0 |
| Zinc, dissolved (µg/L as Zn) | 12 | 0 | 0 | 0 | 0 | 0 | 23 | 1 | 20 | 19 | 14 | 0 | 18 | 0 | 14 | 0 | 2 | 33 |
| **Pesticides** | | | | | | | | | | | | | | | | | | |
| Cyanide, total (mg/L as CN) | 0 | -- | -- | -- | -- | -- | 5 | 0 | 0 | 0 | 0 | -- | 0 | 0 | 0 | -- | -- | 0 |
| Cyanide, dissolved (mg/L as CN) | 0 | -- | -- | -- | -- | -- | 2 | -- | 1 | 2 | 1 | -- | 0 | -- | 1 | -- | -- | 0 |
| PCB, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| PCB, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Alachlor, total, recoverable (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Aldrin, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Aldrin, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Ametryne, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Atrazine, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | -- | -- | -- | -- | 1 |
| Chlordane, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Chlordane, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Cyanazine, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DDD, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DDD, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DDE, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DDE, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pesticides--Continued | | | | | | | | | | | |
| DDT, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DDT, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| DEF, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Diazinon, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Diazinon, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Dieldrin, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Dieldrin, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Disyston, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Endosulfan, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Endosulfan, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Endrin, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Endrin, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Ethion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Ethion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Guthion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Heptachlor, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Heptachlor, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Heptachlor epoxide, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Heptachlor epoxide, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Lindane, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Lindane, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Malathion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Malathion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methomyl, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methoxychlor, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methoxychlor, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pesticides--Continued | | | | | | | | | | | |
| Methyl parathion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methyl parathion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methyl trithion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Methyl trithion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Metolachlor, water, whole, total recoverable (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Metribuzine, water, whole, total recoverable (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Mirex, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Mirex, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| PCN, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| PCN, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Parathion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Parathion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Perthane, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Perthane, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Phorate, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Prometone, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Prometryne, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Propazine, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Propham, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Sevin, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Silvex, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Simazine, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Simetryne, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Toxaphene, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pesticides--Continued** | | | | | | | | | | | | | | | | | | |
| Toxaphene, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Trifluralin, total recoverable (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Trithion, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| Trithion, dissolved (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| 2,4-D, total (µg/L) | 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6 | -- | -- | -- | -- | 4 |
| 2,4-DP, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| 2,4,5-T, total (µg/L) | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 0 |
| **Chlorophyll data** | | | | | | | | | | | | | | | | | | |
| Chlorophyll-A, phytoplankton (µg/L) | 1 | 178 | 48 | 56 | 44 | 22 | 1 | -- | 1 | 1 | 1 | 18 | 1 | -- | 2 | 67 | 55 | -- |
| Chlorophyll-B, phytoplankton (µg/L) | 1 | 178 | 48 | 56 | 44 | 22 | 1 | -- | 1 | 1 | 1 | 18 | 1 | -- | 2 | 67 | 55 | -- |
| Chlorophyll-C, phytoplankton (µg/L) | -- | 178 | 48 | 56 | 44 | 22 | -- | -- | -- | -- | -- | 18 | -- | -- | -- | 67 | 55 | -- |
| **Sediment data** | | | | | | | | | | | | | | | | | | |
| Sediment, bed material, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .125 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .250 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than .500 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, fall diameter, distilled water, percent finer than 1.00 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |

Table 24.--Number of measurements of water-quality characteristics and constituents exceeding detection limits--Continued

| Water-quality characteristic or constituent | KEN (1) | AWD REF (2) | AWD LAK (3) | AWD MUD (4) | AWD JIM (5) | AWD DEP (6) | PIN (7) | RES (8) | JAM (9) | LAM (10) | OAK (11) | HYT (12) | LUD (13) | LIN (14) | HEC (15) | MUD (16) | SAN (17) | COL (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sediment data--Continued | | | | | | | | | | | |
| Sediment, bed material, sieve diameter, percent finer than 2.00 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, sieve diameter, percent finer than 4.00 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, sieve diameter, percent finer than 8.00 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, bed material, sieve diameter, percent finer than 16.0 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, suspended, sieve diameter, percent finer than .062 mm | 15 | -- | -- | -- | -- | -- | 12 | -- | 14 | 15 | 12 | -- | 16 | -- | 8 | -- | -- | 35 |
| Sediment, suspended, fall diameter, distilled water, percent finer than .004 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .016 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sediment, suspended, fall diameter, distilled water, percent finer than .062 mm | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | 9 |
| Sediment, suspended concentration (mg/L) | 16 | -- | -- | -- | -- | -- | 15 | -- | 19 | 56 | 11 | -- | 18 | -- | 16 | 0 | 0 | 46 |
| Sediment discharge, tons per day | 16 | -- | -- | -- | -- | -- | 15 | -- | 19 | 56 | 11 | -- | 18 | -- | 16 | 0 | 0 | 46 |