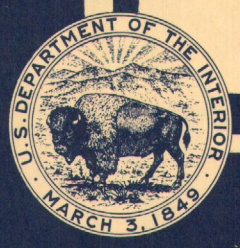
1971

# Water Resources Data for Montana

## Part 2. Water Quality Records






UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Montana
and with other agencies

# CALENDAR FOR WATER YEAR 1971

## OCTOBER 1970

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

## NOVEMBER 1970

| S | M | T | W | T | F | S |
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| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | | | | | |

## DECEMBER 1970

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| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | | |

## JANUARY 1971

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| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

## FEBRUARY 1971

| S | M | T | W | T | F | S |
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| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | | | | | | |

## MARCH 1971

| S | M | T | W | T | F | S |
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| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 | | | |

## APRIL 1971

| S | M | T | W | T | F | S |
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| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | |

## MAY 1971

| S | M | T | W | T | F | S |
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| | | | | | | 1 |
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| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | | | | | |

## JUNE 1971

| S | M | T | W | T | F | S |
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| | | 1 | 2 | 3 | 4 | 5 |
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| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

## JULY 1971

| S | M | T | W | T | F | S |
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| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

## AUGUST 1971

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |

## SEPTEMBER 1971

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

# 1971

# Water Resources Data for Montana

## Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Montana
and with other agencies

Prepared in cooperation with

Montana Fish and Game Department
Corps of Engineers, U.S. Army
Bureau of Reclamation, U.S. Department of the Interior
Bureau of Indian Affairs, U.S. Department of the Interior
Bureau of Land Management, U.S. Department of the Interior
Environmental Protection Agency

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

1. Water Resources Data for Montana
   Part 1. Surface Water Records

2. Water Resources Data for Montana
   Part 2. Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
421 Federal Building
P.O. Box 1696
Helena, Montana 59601

1973

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# WATER RESOURCES DATA FOR MONTANA, 1971

## Part 2. Water Quality Records

## INTRODUCTION

Water resources data for the 1971 water year for Montana include records of data for the chemical and physical characteristics of surface water. Data on the quality of surface water (chemical, temperature, and sediment) were collected from designated sampling sites at predetermined intervals such as once daily, weekly, monthly or less frequently. Records for a few pertinent water-quality stations in bordering States are also included. The records were collected by the Water Resources Division of the U.S. Geological Survey under the direction of George M. Pike, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Montana.

The Geological Survey has published records of chemical quality, suspended sediment, and water temperatures since 1941 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Beginning with the 1964 water year, water-quality records also have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these reports is limited; they are designed primarily for rapid release of data shortly after the end of the water year to meet local needs. These records will be published later in Geological Survey water-supply papers.

## COOPERATION

This report was prepared by the U.S. Geological Survey under cooperative agreement with the following organization:

1. Montana Fish and Game Department, F. H. Dunkle, Director.

Agencies furnishing assistance were:

1. Some of the records were obtained at the request of other federal agencies as a part of the program of the U.S. Department of the Interior for the development of the Missouri River basin.
2. Corps of Engineers, U.S. Army.
3. Environmental Protection Agency.

## DEFINITION OF TERMS

Terms related to water-quality and hydrologic data, as used in this report are defined as follows:

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

Bed Material is the shifting portion of fragmented alluvial material of which the streambed is composed.

Biochemical oxygen demand (BOD) is the amount of oxygen required by bacteria while stablizing decomposable organic matter under aerobic conditions.

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

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate incubation membrane filter method.

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

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

Daily mean discharge is the mean discharge for one day.

Mean discharge is the arithmetic mean of individual daily mean discharge during a specific period.

Instantaneous discharge is the discharge at a particular instant of time. This discharge is generally reported instead of daily mean discharge when a time value is shown.

Drainage area of a stream at a specified location is that area, measured in horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point.

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

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

Hardness of water is a physical-chemical characteristic attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Hydrogen-ion concentration (pH) indicates the degree of acidity or alkalinity of water and is expressed in terms of pH units. The pH value of a solution is the negative logarithm of the concentration of hydrogen ions, in moles per liter.

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue color when methylene blue dye reacts with synthetic detergent compounds.

Milliequivalents per liter is a unit for expressing the concentration of chemical constituents in terms of interreacting values of electrically charged particles, or ions, in solution. One milliequivalent per liter of a positively charged ion will react with one milliequevalent per liter of a negatively charged ion.

Micrograms per liter (µg/l, UG/L) is a unit expressing the concentration of chemical constituents in solution as weight (micrograms) of solute per unit volume (liter) of one milligram per liter.

Milligrams per liter (mg/l, MG/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the weight of solute per unit volume of water. Milligrams or micrograms per liter may be converted to milliequivalents (one thousandth of a gramequivalent weight of a constituent) per liter by multiplying by the factors in table 1, page 4. Concentration of suspended sediment also is expressed in mg/l, and is based on the weight of sediment per liter of water-sediment mixture. Sediment concentrations may be converted to parts per million by using the factors in table 2, page 4.

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

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined either by sieve of sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in a native water (the river water at the time and point of sampling) (Guy, 1969).

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

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

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis (Guy, 1969).

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

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

Suspended-sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time. It is computed by multiplying discharge by the mean concentration (mg/l) times 0.0027.

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

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour period.

Table 1. Factors for conversion of chemical constituents in milligrams or micrograms per liter to milliequivalents per liter.

| Ion | Multiply by | Ion | Multiply by |
|---|---|---|---|
| Aluminum ($Al^{+3}$)* | 0.11119 | Hydroxide ($OH^{-1}$) | 0.05880 |
| Ammonia as $NH_4^{+1}$ | .05544 | Iodide ($I^{-1}$) | .00788 |
| Barium ($Ba^{+2}$)* | .01456 | Iron ($Fe^{+3}$)* | .05372 |
| Beryllium ($Be^{+3}$)* | .33288 | Lead ($Pb^{+2}$)* | .00965 |
| Bicarbonate ($HCO_3^{-1}$) | .01639 | Lithium ($Li^{+1}$)* | .14411 |
| Bromide ($Br^{-1}$) | .01251 | Magnesium ($Mg^{+2}$) | .08226 |
| Cadmium ($Cd^{+2}$)* | .01779 | Manganese ($Mn^{+2}$)* | .03640 |
| Calcium ($Ca^{+2}$) | .04990 | Nickel($Ni^{+2}$)* | .03406 |
| Carbonate ($CO_3^{-2}$) | .03333 | Nitrate ($NO_3^{-1}$) | .01613 |
| Chloride ($Cl^{-1}$) | .02821 | Nitrite ($NO_2^{-1}$) | .02174 |
| Chromium ($Cr^{+6}$)* | .11539 | Phosphate ($PO_4^{-3}$) | .03159 |
| Cobalt ($CO^{+2}$)* | .03394 | Potassium ($K^{+1}$) | .02557 |
| Copper ($Cu^{+2}$)* | .03148 | Sodium ($Na^{+1}$) | .04350 |
| Cyanide ($CN^{-1}$) | .03844 | Strontium ($Sr^{+2}$)* | .02283 |
| Fluoride ($F^{-1}$) | .05264 | Sulfate ($SO_4^{-2}$) | .02082 |
| Hydrogen ($H^{+1}$) | .99209 | Zinc ($Zn^{+2}$)* | .03060 |

* Constituent reported in micrograms per liter; multiply by factor and divide results by 1,000.

Table 2.--Factors for conversion of sediment concentration in milligrams per liter to parts per million*
(All values calculated to three significant figures)

| Range of concentration in 1000 mg/l | Divide by | Range of concentration in 1000 mg/l | Divide by | Range of concentration in 1000 mg/l | Divide by | Range of concentration in 1000 mg/l | Divide by |
|---|---|---|---|---|---|---|---|
| 0 - 8 | 1.00 | 201-217 | 1.13 | 411-424 | 1.26 | 619-634 | 1.39 |
| 8.05- 24 | 1.01 | 218-232 | 1.14 | 227-440 | 1.27 | 636-650 | 1.40 |
| 24.2 - 40 | 1.02 | 234-248 | 1.15 | 443-457 | 1.28 | 652-666 | 1.41 |
| 40.5 - 56 | 1.03 | 250-264 | 1.16 | 460-473 | 1.29 | 668-682 | 1.42 |
| 56.5 - 72 | 1.04 | 266-280 | 1.17 | 476-489 | 1.30 | 684-698 | 1.43 |
| 72.5 - 88 | 1.05 | 282-297 | 1.18 | 492-506 | 1.31 | 700-715 | 1.44 |
| 88.5 -104 | 1.06 | 299-313 | 1.19 | 508-522 | 1.32 | 717-730 | 1.45 |
| 105 -120 | 1.07 | 315-329 | 1.20 | 524-538 | 1.33 | 732-747 | 1.46 |
| 121 -136 | 1.08 | 331-345 | 1.21 | 540-554 | 1.34 | 749-762 | 1.47 |
| 137 -152 | 1.09 | 347-361 | 1.22 | 556-570 | 1.35 | 765-780 | 1.48 |
| 153 -169 | 1.10 | 363-378 | 1.23 | 572-585 | 1.36 | 782-796 | 1.49 |
| 170 -185 | 1.11 | 380-393 | 1.24 | 587-602 | 1.37 | 798-810 | 1.50 |
| 186 -200 | 1.12 | 395-409 | 1.25 | 604-617 | 1.38 | | |

*Based on water density of 1.000 g/ml and a specific gravity of sediment of 2.65.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. This ratio should be known especially for water used for irrigating farmland.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

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

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

Thermograph is a thermometer that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the location of the thermograph or a digital mechanism that automatically records water temperature on paper tape.

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

Tons per acre-foot indicates the dry weight of dissolved solids in 1 acre-foot of water. It is computed by multipling the concentration in milligrams per liter by 0.00136.

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

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

## SPECIAL NETWORKS AND PROGRAMS

Some of the stations for which data are published in this report are included in special networks and programs. These stations are identified by their title, set in parentheses, under the station name.

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

International Hydrological Decade (IHD) River Stations provide a general index of runoff and meterials in the water balance (discharge of water, and dissolved and transported solids) of the world. In the United States, IHD Stations provide indices of runoff and the general distribution of water in the principal river basins of the conterminous United States and Alaska.

Irrigation network stations are water-quality stations located at or near certain streamflow gaging stations west of the main stem of the Mississippi River. Data collected at these stations are used to evaluate the chemical quality of surface waters used for irrigation and the changes resulting from the drainage of irrigated lands. Prior to water year 1966, the data for these stations were published in the annual water-supply paper series, "Quality of Surface Water for Irrigation, Western States."

Pesticide program is a network of a regularly sampled water-quality station where additional monthly samples are collected to determine the concentration and distribution of pesticides in streams whose waters are used for irrigation or in streams in areas where potential contamination could result from the application of the commonly used insecticides and herbicides.

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

## DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of indentification, each water-quality station, gaging station, and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record and continuous-record stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete 8-digit number for each station, such as 06090500, includes the part number "06" and a 6-digit station number. This number appears just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

## COLLECTION AND EXAMINATION OF DATA

Water samples for analyses usually are collected at or near gaging stations. The discharge records at these stations are used in conjunction with the computations of the chemical constituents and sediment loads. Discharge records for streams in Montana have been released in the report, "Water Resources Data for Montana, 1971, Part 1. Surface Water Records."

The data in this report includes a description of the sampling station and tabulations of the samples analyzed. The description of the sampling station gives the location, drainage area, periods of record for the various water-quality data, extremes of the pertinent data, and general remarks, in a format similar to that used for streamflow gaging stations.

Data on the quality of surface water were collected from designated sampling sites (map on page 11 ) at predetermined intervals such as once daily, weekly, monthly or less frequently.

Water-quality information is presented for chemical quality, microbiological, water temperature, and fluvial sediment. Chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, sodium adsorption ratio, specific conductance, and pH. Microbiological information includes quantitative identification of certain bacteriological indicator organisms. Water-temperature data represent once-daily observations except for stations where a continuous temperature recorder furnishes information from which daily minimums and maximums are obtained. Fluvial-sediment information is given for suspended-sediment discharges and concentrations and for particle-size distribution of suspended sediment and bed material.

Prior to the 1968 water year, data for chemical constituents and concentrations of suspended sediment were reported in parts per million (ppm) and water temperatures were reported in degrees Fahrenheit (°F). In October 1967, the U.S. Geological Survey began to use the metric system; data for chemical constituents and concentrations of suspended sediment are now reported in milligrams per liter (mg/l) and water temperatures are given in degrees Celsius (centigrade, °C). In waters with a density of 1.000 g/ml (grams per milliliter), parts per millions and milligrams per liter can be considered equal. In waters with a density greater than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter (see table 2 on page 4). To convert temperature in degrees Celsius to degrees Fahrenheit, see table 3 below.

Table 3.--Degrees Celsius (°C)*to degrees Fahrenheit (°F)
(Temperature reported to nearest 0.5°C)

| °C | °F | °C | °F | °C | °F | °C | °F | °C | °F |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 32 | 10.0 | 50 | 20.0 | 68 | 30.0 | 86 | 40.0 | 104 |
| .5 | 33 | 10.5 | 51 | 20.5 | 69 | 30.5 | 87 | 40.5 | 105 |
| 1.0 | 34 | 11.0 | 52 | 21.0 | 70 | 31.0 | 88 | 41.0 | 106 |
| 1.5 | 35 | 11.5 | 53 | 21.5 | 71 | 31.5 | 89 | 41.5 | 107 |
| 2.0 | 36 | 12.0 | 54 | 22.0 | 72 | 32.0 | 90 | 42.0 | 108 |
| 2.5 | 36 | 12.5 | 54 | 22.5 | 72 | 32.5 | 90 | 42.5 | 108 |
| 3.0 | 37 | 13.0 | 55 | 23.0 | 73 | 33.0 | 91 | 43.0 | 109 |
| 3.5 | 38 | 13.5 | 56 | 23.5 | 74 | 33.5 | 92 | 43.5 | 110 |
| 4.0 | 39 | 14.0 | 57 | 24.0 | 75 | 34.0 | 93 | 44.0 | 111 |
| 4.5 | 40 | 14.5 | 58 | 24.5 | 76 | 34.5 | 94 | 44.5 | 112 |
| 5.0 | 41 | 15.0 | 59 | 25.0 | 77 | 35.0 | 95 | 45.0 | 113 |
| 5.5 | 42 | 15.5 | 60 | 25.5 | 78 | 35.5 | 96 | 45.5 | 114 |
| 6.0 | 43 | 16.0 | 61 | 26.0 | 79 | 36.0 | 97 | 46.0 | 115 |
| 6.5 | 44 | 16.5 | 62 | 26.5 | 80 | 36.5 | 98 | 46.5 | 116 |
| 7.0 | 45 | 17.0 | 63 | 27.0 | 81 | 37.0 | 99 | 47.0 | 117 |
| 7.5 | 45 | 17.5 | 63 | 27.5 | 81 | 37.5 | 99 | 47.5 | 117 |
| 8.0 | 46 | 18.0 | 64 | 28.0 | 82 | 38.0 | 100 | 48.0 | 118 |
| 8.5 | 47 | 18.5 | 65 | 28.5 | 83 | 38.5 | 101 | 48.5 | 119 |
| 9.0 | 48 | 19.0 | 66 | 29.0 | 84 | 39.0 | 102 | 49.0 | 120 |
| 9.5 | 49 | 19.5 | 67 | 29.5 | 85 | 39.5 | 103 | 49.5 | 121 |

*C = 5/9 (°F - 32) or °F = 9/5 (°C) + 32

In October 1968, the Geological Survey began reporting many of the chemical constituents as well as the minor elements and some pollutants, in micrograms per liter instead of milligrams per liter. (See "Definitions of Terms," p. 1).

## Solutes

The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Brown, Skougstad, and Fishman (1970). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and the mixing of the stream. Some must be sampled at several verticals across the channel to determine accurately the solute load.

The daily chemical quality data in this report generally represent equal-volume composites for 2- to 30-day periods; the composite periods are selected on the basis of specific conductance of the daily samples and fluctuation of water discharge.

## Temperature

Water temperatures are measured at most of the water-quality stations. For daily stations, the water temperatures are taken at about the same time each day when sample is collected. Large streams have small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where continuously recording thermographs are present, the records consist of maximum and minimum temperatures for each day and the monthly averages.

## Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross-section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the sub-divided day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the sub-divided day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

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

## WATER-SUPPLY PAPERS

Table 4 below shows the annual series of water-supply paper that give information on quality of surface water in Montana. Data for Hudson Bay and Missouri River basins are given in parts 5-6 and for upper Columbia River basin are given in Part 12.

Table 4.--Water-supply paper numbers and parts, water years, 1947-68

| Year | Parts 5-6 | Part 12 | Year | Parts 5-6 | Part 12 |
|---|---|---|---|---|---|
| 1947 | 1102 | ---- | 1958 | 1572 | 1574 |
| 1948 | 1132 | ---- | 1959 | 1643 | 1645 |
| 1949 | 1162 | ---- | 1960 | 1743 | 1745 |
| 1950 | 1187 | ---- | 1961 | 1883 | 1885 |
| 1951 | 1198 | 1200 | 1962 | 1943 | 1945 |
| 1952 | 1251 | 1253 | 1963 | 1949 | 1951 |
| 1953 | 1291 | 1293 | 1964 | 1956 | 1959 |
| 1954 | 1351 | 1353 | 1965 | 1963 | 1966 |
| 1955 | 1401 | 1403 | 1966 | 1993 | 1996 |
| 1956 | 1451 | 1453 | 1967 | 2013 | 2016 |
| 1957 | 1521 | 1523 | 1968 | A2095 | A2100 |

A In press.

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_____ 1941, Methods of analyzing sediment samples: Rept. 4.

_____ 1953, Accuracy of sediment size analyses made by the bottom-withdrawal-tube method: Rept. 10.

_____ 1957, The development and calibration of visual accumulation tube: Rept. 11.

U.S. Inter-Agency Committee on Water Resources, Subcommittee on Sedimentation, A study of methods used in measurement and analysis of sediment loads in streams. Published by the St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minn.

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_____ 1959, Federal Inter-agency sedimentation instruments and reports: Rept. AA.

_____ 1961, The single stage sampler for suspended sediment: Rept. 13.

_____ 1963, Determinations of fluvial sediment discharge: Rept. 14.

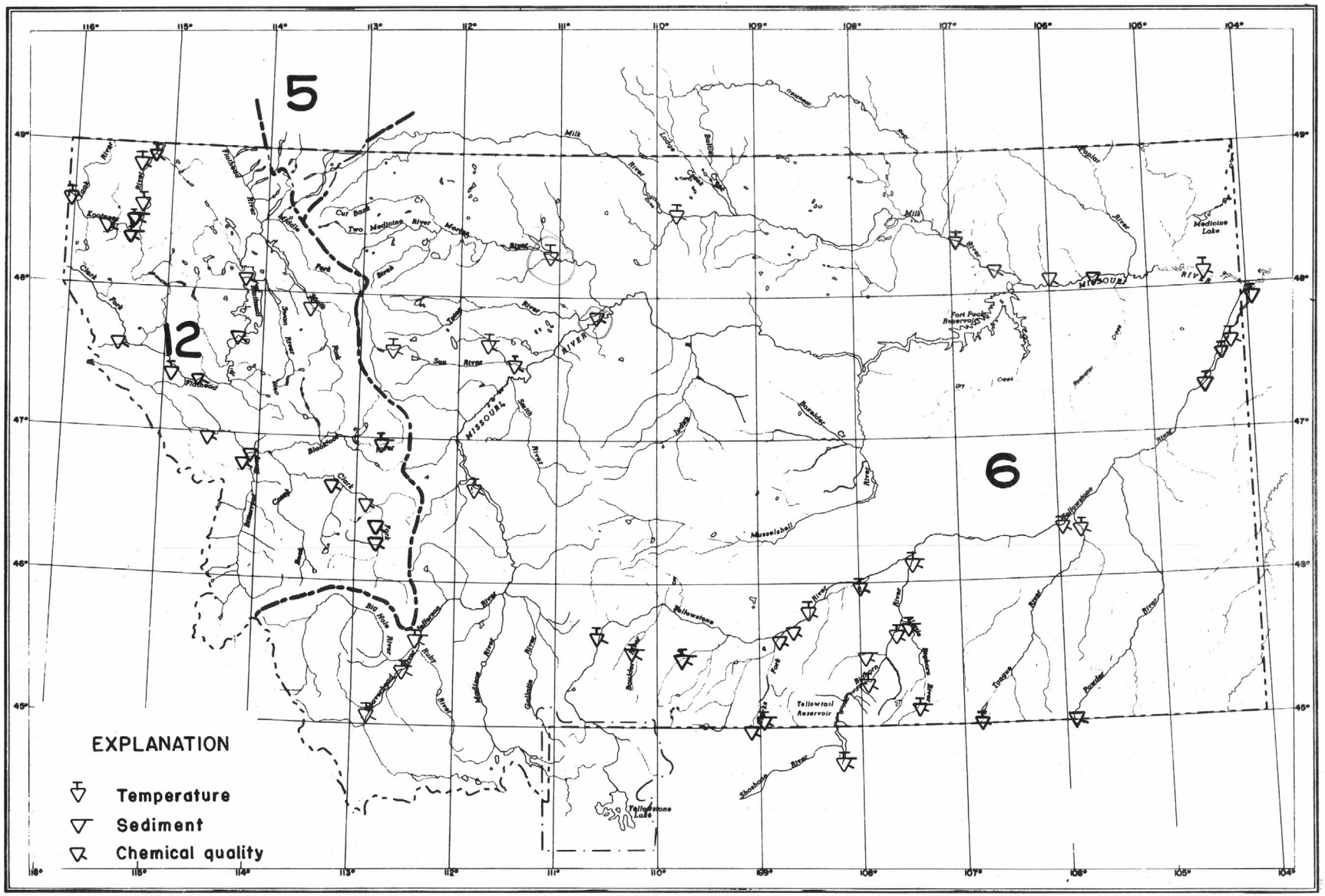


Figure 1– Location of water-quality stations in Montana.

PART 6. MISSOURI RIVER BASIN

MISSOURI RIVER MAIN STEM

06016000 BEAVERHEAD RIVER AT BARRETTS, MONT.

LOCATION.--Lat 45°07'43", long 112°44'25", in NW¼NW¼NW¼ sec.20, T.8 S., R.9 W., Beaverhead County, at private road bridge 800 ft upstream from Barretts, 1 mile downstream from gaging station, 2.5 miles downstream from Grasshopper Creek, and 8 miles southwest of Dillon.

DRAINAGE AREA.--2,737 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: November 1949 to September 1951, July 1965 to September 1971.
Water temperatures: July 1965 to September 1971.
Sediment records: May 1949 to September 1951.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 380 mg/l Jan. 1-31; minimum, 276 mg/l June 2-30.
Hardness: Maximum, 280 mg/l Jan. 1-31; minimum, 190 mg/l June 2-30.
Specific conductance: Maximum daily, 590 micromhos Jan. 7; minimum daily, 412 micromhos June 2.
Water temperatures: Maximum observed, 20.0°C Aug. 8, 10; minimum, 0.5°C Jan. 4, 5.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DISCHARGE (CFS) | TEMPERATURE (DEG C) | DISSOLVED SILICA (SIO2) (MG/L) | DISSOLVED IRON (FE) (UG/L) | DISSOLVED CALCIUM (CA) (MG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED SODIUM (NA) (MG/L) | DISSOLVED POTASSIUM (K) (MG/L) | BICARBONATE (HCO3) (MG/L) | CARBONATE (CO3) (MG/L) | DISSOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 04-12 | -- | 527 | -- | 20 | -- | 61 | 22 | 23 | 5.0 | 248 | 0 | 75 |
| 14-23 | -- | 428 | -- | 19 | -- | 54 | 21 | 23 | 4.8 | 232 | 0 | 74 |
| 27-31 | -- | 382 | -- | 18 | -- | 59 | 22 | 25 | 4.8 | 250 | 0 | 80 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 517 | -- | 19 | -- | 58 | 21 | 23 | 5.0 | 243 | 0 | 74 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 460 | -- | 18 | -- | 56 | 24 | 24 | 4.9 | 257 | 0 | 79 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 369 | -- | 19 | 100 | 73 | 24 | 24 | 4.5 | 188 | 53 | 80 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 456 | -- | 19 | 20 | 67 | 20 | 24 | 4.6 | 199 | 28 | 87 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 421 | -- | 20 | 10 | 64 | 22 | 25 | 5.4 | 249 | 0 | 90 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 609 | -- | 18 | 20 | 47 | 21 | 22 | 4.1 | 233 | 0 | 53 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 1160 | -- | 18 | 20 | 51 | 18 | 19 | 3.9 | 222 | 0 | 58 |
| JUNE | | | | | | | | | | | | |
| 02-30 | -- | 1300 | -- | 18 | 60 | 47 | 17 | 20 | 4.0 | 218 | 0 | 53 |
| JULY | | | | | | | | | | | | |
| 01-31 | -- | 1020 | -- | 20 | 20 | 52 | 18 | 20 | 4.0 | 237 | 0 | 55 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 865 | -- | 20 | 10 | 54 | 19 | 20 | 3.6 | 240 | 0 | 59 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 895 | -- | 20 | 0 | 53 | 21 | 23 | 4.1 | 245 | 0 | 65 |
| WTD. AVG. | -- | -- | -- | 19 | 27 | 54 | 20 | 22 | 4.2 | 231 | 4 | 64 |
| TIME WTD. AVG. | -- | 715 | -- | 19 | 29 | 57 | 21 | 22 | 4.4 | 231 | 7 | 69 |
| TONS PER DAY | -- | -- | -- | 37 | 0 | 105 | 38 | 41 | 8.2 | 446 | 7 | 124 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV. | | | | | | | | | | | | |
| 04... | 1615 | 543 | 5.0 | 18 | 0 | 57 | 21 | 24 | 4.7 | 207 | 21 | 74 |
| FEB., 1971 | | | | | | | | | | | | |
| 03... | 1255 | 446 | 2.0 | 17 | 220 | 52 | 21 | 22 | 6.5 | 228 | 0 | 77 |
| MAR. | | | | | | | | | | | | |
| 31... | 1745 | 455 | 7.0 | 18 | 60 | 61 | 21 | 23 | 4.6 | 247 | -- | 85 |
| JULY | | | | | | | | | | | | |
| 01... | 1445 | 1220 | 17.0 | 19 | 40 | 40 | 19 | 20 | 3.6 | 218 | 0 | 54 |

| DATE | TIME | DISCHARGE (CFS) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED MANGANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 08... | 1055 | 524 | .010 | -- | -- |
| NOV. | | | | | |
| 04... | 1615 | 543 | .010 | 30 | -- |
| DEC. | | | | | |
| 02... | 0925 | 505 | .000 | -- | -- |
| JAN., 1971 | | | | | |
| 05... | 1330 | 390 | .000 | -- | -- |
| FEB. | | | | | |
| 03... | 1255 | 446 | .080 | -- | 100 |
| MAR. | | | | | |
| 03... | 1215 | 437 | .070 | -- | -- |
| 31... | 1745 | 455 | .080 | 0 | 36 |

06016000 BEAVERHEAD RIVER AT BARRETTS, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 466 mg/l Jan. 14-31, 1967; minimum, 274 mg/l June 2-30, 1967.
Hardness: Maximum, 316 mg/l Jan. 1-13, 1967; minimum, 170 mg/l June 2-30, 1967.
Specific conductance: Maximum daily, 733 micromhos Jan. 24, 1967; minimum daily, 353 micromhos June 8, 1967.
Water temperatures: Maximum, 21.0°C Aug. 29, 1970; minimum observed, freezing point Jan. 24, 1967, Dec. 31, 1968, Jan. 23, 1969.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Minimum observed during water year: Dissolved solids, 273 mg/l July 1; hardness, 180 mg/l July 1. The computations of tons per day of dissolved solids refer to flow past the gaging station. Temperature recorder at gaging station 1 mile upstream from sampling site. Recorder removed Oct. 1 to May 11, July 26 to Sept. 30. Thermograph records furnished by Montana Fish and Game Department.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 04-12 | 11 | .4 | -- | -- | 339 | .46 | 477 | 240 | 38 | .6 | 530 | 8.0 |
| 14-23 | 11 | .4 | -- | -- | 322 | .44 | 378 | 220 | 30 | .7 | 516 | 8.1 |
| 27-31 | 12 | .4 | -- | -- | 345 | .47 | 358 | 240 | 33 | .7 | 538 | 8.2 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 11 | .7 | -- | -- | 331 | .49 | 501 | 230 | 33 | .7 | 520 | 8.0 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 6.0 | .6 | -- | -- | 339 | .47 | 431 | 240 | 28 | .7 | 550 | 8.1 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 11 | .6 | .10 | .05 | 380 | .52 | 379 | 280 | 37 | .6 | 557 | 8.5 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 11 | .6 | .10 | .03 | 360 | .49 | 443 | 250 | 40 | .7 | 539 | 8.4 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 12 | .5 | .10 | .03 | 362 | .49 | 411 | 250 | 46 | .7 | 589 | 8.4 |
| APR. | | | | | | | | | | | | |
| 01-30 | 9.2 | .5 | .00 | .06 | 289 | .39 | 475 | 200 | 13 | .7 | 532 | 8.2 |
| MAY | | | | | | | | | | | | |
| 01-31 | 8.5 | .3 | .01 | .03 | 286 | .39 | 896 | 200 | 19 | .6 | 468 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 02-30 | 9.0 | .5 | .00 | .09 | 276 | .38 | 969 | 190 | 9 | .6 | 424 | 8.1 |
| JULY | | | | | | | | | | | | |
| 01-31 | 11 | 1.1 | .00 | .06 | 298 | .41 | 821 | 200 | 10 | .6 | 485 | 8.0 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 6.6 | .2 | .00 | .03 | 300 | .41 | 701 | 210 | 16 | .6 | 492 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 11 | .5 | .15 | .03 | 319 | .43 | 771 | 220 | 18 | .7 | 514 | 8.1 |
| WTD. AVG. | 9.5 | .5 | .04 | .05 | 311 | .43 | -- | 216 | 21 | .6 | 500 | 8.1 |
| TIME WTD. AVG. | 9.8 | .5 | .05 | .05 | 323 | .44 | -- | 225 | 25 | .7 | 516 | 8.2 |
| TONS PER DAY | 18 | 1.0 | .08 | .10 | 600 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| NOV. | | | | | | | | | | | | |
| 04... | 11 | .5 | -- | -- | 334 | .45 | 485 | 230 | 24 | .7 | 526 | 8.6 |
| FEB., 1971 | | | | | | | | | | | | |
| 03... | 9.8 | .5 | .00 | .25 | 320 | .44 | 385 | 220 | 33 | .7 | 477 | 7.9 |
| MAR. | | | | | | | | | | | | |
| 31... | 10 | .6 | .20 | .09 | 346 | .47 | 425 | 240 | 36 | .6 | 529 | 8.2 |
| JULY | | | | | | | | | | | | |
| 01... | 8.6 | .6 | .21 | .15 | 273 | .37 | 899 | 180 | 0 | .7 | 458 | 7.9 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| MAY | | | | | |
| 06... | 1210 | 973 | .060 | -- | -- |
| JUNE | | | | | |
| 02... | 1020 | 1470 | .060 | 20 | -- |
| JULY | | | | | |
| 01... | 1445 | 1220 | .080 | 50 | 2 |
| AUG. | | | | | |
| 04... | 1800 | 850 | .19 | -- | -- |
| SEP. | | | | | |
| 03... | 1310 | 878 | .070 | 10 | -- |

06016000 BEAVERHEAD RIVER AT BARRETTS, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | 547 | 542 | 572 | 510 | 578 | 568 | 513 | --- | 448 | 489 | 503 |
| 2 | --- | 522 | 546 | 578 | --- | 580 | 568 | 497 | 412 | 461 | 472 | 497 |
| 3 | --- | 537 | 535 | 572 | 539 | 578 | 570 | 491 | 422 | 459 | 478 | 497 |
| 4 | 514 | 551 | 544 | 574 | 571 | --- | 571 | 495 | 429 | 461 | 477 | 495 |
| 5 | 543 | 537 | 544 | 578 | 562 | 578 | 580 | 479 | 442 | 466 | 482 | 497 |
| 6 | 531 | 540 | 534 | 584 | 582 | 567 | 561 | 477 | 440 | 467 | 486 | 497 |
| 7 | 533 | 544 | 543 | 590 | 574 | 587 | 539 | 472 | 448 | 474 | 479 | 498 |
| 8 | 525 | 547 | 539 | 585 | 575 | 576 | 558 | 475 | 453 | 474 | 484 | 505 |
| 9 | 524 | 538 | 543 | 578 | 573 | 578 | 559 | 471 | 455 | 467 | 484 | 481 |
| 10 | 534 | 532 | 546 | 574 | 573 | 572 | 553 | 457 | 442 | 476 | 485 | 492 |
| 11 | 531 | 550 | 546 | 574 | 563 | 556 | 530 | 458 | 444 | 475 | 484 | 481 |
| 12 | 533 | 544 | 549 | 581 | 567 | 578 | 538 | 469 | 429 | 474 | 489 | 510 |
| 13 | --- | 541 | 570 | 585 | 563 | 578 | 536 | 470 | 444 | 474 | 493 | 497 |
| 14 | 491 | 531 | 564 | --- | 552 | 576 | 537 | 463 | 442 | 480 | 486 | 510 |
| 15 | 507 | 551 | 562 | 582 | 541 | 572 | 523 | 456 | 438 | 480 | 486 | 512 |
| 16 | 507 | 537 | 554 | 574 | 549 | 577 | 507 | 464 | --- | 476 | 500 | 512 |
| 17 | 543 | --- | 554 | 574 | 571 | 577 | 517 | 464 | 440 | 480 | 501 | 506 |
| 18 | 507 | --- | 554 | 582 | 573 | 561 | 539 | 449 | 448 | 480 | 501 | 504 |
| 19 | 506 | 531 | 566 | 584 | 573 | 567 | 537 | 463 | 448 | 480 | 501 | 503 |
| 20 | 497 | 532 | 565 | 584 | 575 | 567 | 529 | 463 | 444 | 476 | 501 | 505 |
| 21 | 534 | 531 | 563 | 586 | 578 | 567 | 526 | 464 | 448 | 475 | 503 | 510 |
| 22 | 541 | 557 | 564 | 585 | 578 | 572 | 514 | 472 | 448 | 474 | 502 | 509 |
| 23 | 542 | 549 | 564 | 584 | 575 | 567 | 517 | 472 | 442 | 475 | 509 | 510 |
| 24 | --- | 550 | 564 | 582 | 573 | 567 | 498 | 472 | 448 | 480 | 503 | 510 |
| 25 | --- | 537 | 584 | 581 | 581 | 556 | 510 | 474 | --- | 483 | 517 | 510 |
| 26 | --- | 530 | 566 | --- | 574 | 557 | 498 | 470 | 455 | 477 | 510 | 505 |
| 27 | 575 | 530 | 570 | 578 | 575 | 521 | 508 | 464 | 441 | 477 | 511 | 501 |
| 28 | 525 | 531 | 573 | 584 | 573 | --- | 511 | 456 | 438 | 475 | 529 | 515 |
| 29 | 568 | 537 | 566 | 581 | --- | 545 | 500 | 448 | 432 | 483 | --- | 512 |
| 30 | 554 | 531 | 573 | 572 | --- | 555 | 511 | 450 | 440 | 484 | 529 | 506 |
| 31 | 515 | --- | 574 | 552 | --- | 550 | --- | 448 | --- | 476 | 526 | --- |
| MONTH | --- | 539 | 557 | 579 | 566 | 568 | 534 | 469 | 441 | 474 | 497 | 503 |
| YEAR | 521 | | | | | | | | | | | |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (ONCE-DAILY RECORDS)

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | 6.0 | 2.5 | 2.0 | 5.0 | 5.0 | 8.0 | 11.5 | --- | --- | 19.0 | 15.0 |
| 2 | --- | 5.5 | 2.5 | 1.5 | --- | 4.0 | 8.5 | 12.5 | --- | --- | 19.0 | 16.5 |
| 3 | --- | 6.0 | 2.0 | 1.5 | 3.0 | 4.5 | 8.5 | 12.0 | --- | --- | 18.5 | 15.0 |
| 4 | 13.5 | 5.5 | 2.5 | 0.5 | 3.5 | --- | 9.0 | 9.5 | --- | --- | 19.0 | 18.0 |
| 5 | 12.0 | 6.0 | 3.0 | 0.5 | 1.5 | 4.5 | 9.0 | 9.5 | --- | --- | 19.5 | 14.5 |
| 6 | 11.5 | 6.0 | 4.0 | 1.0 | 2.0 | 5.0 | 10.0 | 9.5 | --- | --- | 19.0 | 16.5 |
| 7 | 11.0 | 4.5 | 3.5 | 3.0 | 3.0 | 5.0 | 7.5 | 12.0 | --- | --- | 19.5 | 15.5 |
| 8 | 10.5 | 6.0 | 4.0 | 3.0 | 5.0 | 7.0 | 9.0 | 11.5 | --- | --- | 20.0 | 13.5 |
| 9 | 10.0 | 6.5 | 3.0 | 4.5 | 3.5 | 6.5 | 9.5 | 11.5 | --- | --- | 17.0 | 19.0 |
| 10 | 10.0 | 6.0 | 2.5 | 2.5 | 5.5 | 8.0 | 6.0 | 13.5 | --- | --- | 20.0 | 19.0 |
| 11 | 10.5 | 5.5 | 2.0 | 1.0 | 6.0 | 7.5 | 8.0 | 13.0 | --- | --- | 19.5 | 18.5 |
| 12 | 11.0 | 5.5 | 2.0 | 1.0 | 5.5 | 5.5 | 8.0 | --- | --- | --- | 19.0 | 13.5 |
| 13 | --- | 4.5 | 2.5 | 2.5 | 5.0 | 6.0 | 9.5 | --- | --- | --- | 18.0 | 18.0 |
| 14 | 15.0 | 4.5 | 3.0 | --- | 6.0 | 6.0 | 9.0 | --- | --- | --- | 18.5 | 13.5 |
| 15 | 10.0 | 4.0 | 3.5 | 4.0 | 4.5 | 5.0 | 7.0 | --- | --- | --- | 18.0 | 13.0 |
| 16 | 14.0 | 4.0 | 3.5 | 4.5 | 5.0 | 6.0 | 7.0 | --- | --- | --- | 18.5 | 13.5 |
| 17 | 6.0 | --- | 2.0 | 5.0 | 4.0 | 5.0 | 7.5 | --- | --- | --- | 18.5 | 12.5 |
| 18 | 9.0 | --- | 2.5 | 6.0 | 4.5 | 6.0 | 6.5 | --- | --- | --- | 18.5 | 14.0 |
| 19 | 10.5 | 4.0 | 2.0 | 5.0 | 4.5 | 6.5 | 9.5 | --- | --- | --- | 19.5 | 13.5 |
| 20 | 9.5 | 3.5 | 2.5 | 3.5 | 5.0 | 7.5 | 7.5 | --- | --- | --- | 19.0 | 11.0 |
| 21 | 8.5 | 3.0 | 2.5 | 3.0 | 5.5 | 5.5 | 7.5 | --- | --- | --- | 18.5 | 11.0 |
| 22 | 7.0 | 3.0 | 2.0 | 3.0 | 5.5 | 6.0 | 9.0 | --- | --- | --- | 18.5 | 10.5 |
| 23 | 6.5 | 4.0 | 2.0 | 4.0 | 5.5 | 7.0 | 9.0 | --- | --- | --- | 17.0 | 11.5 |
| 24 | --- | 4.5 | 3.0 | 4.0 | 5.0 | 7.0 | 4.0 | --- | --- | --- | 19.5 | 11.0 |
| 25 | --- | 3.0 | 1.5 | 5.5 | 4.0 | 7.0 | 6.0 | --- | --- | --- | 18.0 | 12.0 |
| 26 | --- | 3.0 | 2.0 | --- | 4.0 | 7.5 | 7.5 | --- | --- | 18.0 | 19.5 | 12.0 |
| 27 | 3.5 | 4.0 | 2.5 | 5.5 | 4.5 | 6.5 | 10.0 | --- | --- | 19.0 | 19.5 | 13.0 |
| 28 | 6.0 | 3.5 | 3.0 | 4.5 | 4.5 | --- | 10.5 | --- | --- | 15.0 | 17.0 | 9.5 |
| 29 | 6.0 | 3.5 | 3.0 | 5.0 | --- | 8.5 | 11.5 | --- | --- | 19.0 | --- | 9.5 |
| 30 | 5.5 | 3.0 | 3.5 | 5.5 | --- | 8.5 | 8.5 | --- | --- | 18.5 | 16.0 | 9.0 |
| 31 | 6.5 | --- | 2.5 | 5.0 | --- | 7.0 | --- | --- | --- | 19.0 | 16.5 | --- |
| MONTH | --- | 4.5 | 2.5 | 3.5 | 4.5 | 6.0 | 8.5 | --- | --- | --- | 18.5 | 14.0 |
| YEAR | 8.5 | | | | | | | | | | | |

06016000 BEAVERHEAD RIVER AT BARRETTS, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (THERMOGRAPH RECORD)

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 26 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 29 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MONTH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | 13.0 | 10.0 | 17.0 | 13.5 | --- | --- | --- | --- |
| 2 | --- | --- | --- | --- | 12.0 | 10.5 | 16.0 | 14.0 | --- | --- | --- | --- |
| 3 | --- | --- | --- | --- | 13.0 | 11.0 | 16.5 | 14.0 | --- | --- | --- | --- |
| 4 | --- | --- | --- | --- | 14.0 | 11.0 | 16.5 | 13.5 | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | 14.0 | 10.5 | 17.0 | 13.5 | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | 15.0 | 11.5 | 16.5 | 13.5 | --- | --- | --- | --- |
| 7 | --- | --- | --- | --- | 15.0 | 11.0 | 17.0 | 13.0 | --- | --- | --- | --- |
| 8 | --- | --- | --- | --- | 14.0 | 12.0 | --- | 13.5 | --- | --- | --- | --- |
| 9 | --- | --- | --- | --- | 14.5 | 11.5 | --- | --- | --- | --- | --- | --- |
| 10 | --- | --- | --- | --- | 14.0 | 12.0 | --- | --- | --- | --- | --- | --- |
| 11 | --- | --- | --- | --- | 14.0 | 12.0 | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | 8.5 | 15.5 | 12.0 | --- | --- | --- | --- | --- | --- |
| 13 | --- | --- | --- | 9.0 | 15.5 | 13.0 | --- | --- | --- | --- | --- | --- |
| 14 | --- | --- | --- | 8.5 | 15.5 | 13.0 | --- | --- | --- | --- | --- | --- |
| 15 | --- | --- | --- | 8.5 | 16.0 | 13.0 | --- | --- | --- | --- | --- | --- |
| 16 | --- | --- | --- | 9.0 | 16.0 | 12.0 | 18.5 | 14.5 | --- | --- | --- | --- |
| 17 | --- | --- | 10.0 | 8.5 | 15.5 | 12.0 | 19.0 | 15.0 | --- | --- | --- | --- |
| 18 | --- | --- | 10.5 | 8.5 | 15.0 | 12.0 | 18.5 | 15.0 | --- | --- | --- | --- |
| 19 | --- | --- | 11.5 | 9.0 | 14.5 | 12.0 | 18.5 | 15.0 | --- | --- | --- | --- |
| 20 | --- | --- | 10.5 | 9.0 | 16.5 | 13.0 | 17.0 | 15.0 | --- | --- | --- | --- |
| 21 | --- | --- | 9.0 | 8.5 | 16.5 | 13.0 | 18.5 | 15.0 | --- | --- | --- | --- |
| 22 | --- | --- | 9.5 | 9.0 | 18.0 | 13.5 | 19.5 | 15.0 | --- | --- | --- | --- |
| 23 | --- | --- | 13.0 | 9.0 | 16.5 | 14.0 | 18.5 | 15.0 | --- | --- | --- | --- |
| 24 | --- | --- | 13.0 | 10.0 | 16.5 | 13.5 | 18.5 | 15.0 | --- | --- | --- | --- |
| 25 | --- | --- | 13.5 | 10.0 | 15.5 | 13.5 | 18.5 | 15.0 | --- | --- | --- | --- |
| 26 | --- | --- | 13.0 | 10.0 | 14.0 | 13.5 | --- | --- | --- | --- | --- | --- |
| 27 | --- | --- | 13.5 | 10.0 | 15.0 | 13.0 | --- | --- | --- | --- | --- | --- |
| 28 | --- | --- | 14.0 | 10.5 | 15.0 | 13.0 | --- | --- | --- | --- | --- | --- |
| 29 | --- | --- | 13.5 | 10.5 | 15.5 | 12.0 | --- | --- | --- | --- | --- | --- |
| 30 | --- | --- | 12.0 | 10.5 | 17.0 | 13.0 | --- | --- | --- | --- | --- | --- |
| 31 | --- | --- | 11.5 | 10.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| MONTH | --- | --- | --- | --- | 18.0 | 10.0 | --- | --- | --- | --- | --- | --- |
| YEAR | 19.5 | 8.5 | | | | | | | | | | |

## 06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.

LOCATION.--Lat 45°23'01", long 112°27'07", in SW¼NW¼SE¼ sec.22, T.5 S., R.7 W., Madison County, at gaging station at bridge on State Highway 41, 11.5 miles upstream from Ruby River, 12.7 miles southwest of Twin Bridges, and 14.5 miles northeast of Dillon.

DRAINAGE AREA.--3,619 sq mi.

PERIOD OF RECORD.--Chemical analyses: November 1949 to September 1951, July 1962 to September 1971.
Water temperatures: July 1962 to September 1971.
Sediment records: July 1962 to September 1971.
Prior to October 1968, published as "at Blaine".

EXTREMES.--1970-71:
Dissolved solids: Maximum, 457 mg/l Aug. 13-31; minimum, 355 mg/l May 1-31.
Hardness: Maximum, 290 mg/l Aug. 13-31; minimum, 240 mg/l Feb. 1-28.
Specific conductance: Maximum daily, 785 micromhos Aug. 31; minimum daily, 487 micromhos Jan. 3.
Water temperatures: Maximum, 22.0°C Aug. 1, 8; minimum, freezing point on several days during November to January.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 605 | -- | 24 | -- | 71 | 26 | 27 | 6.5 | 285 | 0 | 100 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 724 | -- | 22 | -- | 73 | 24 | 27 | 5.9 | 271 | 0 | 94 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 680 | -- | 21 | -- | 63 | 25 | 27 | 5.9 | 264 | 0 | 91 |
| JAN. | | | | | | | | | | | | |
| 01-23 | -- | 574 | -- | 24 | 40 | 71 | 25 | 23 | 5.8 | 269 | 0 | 77 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 681 | -- | 24 | 20 | 59 | 23 | 27 | 6.8 | 242 | -- | 99 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 611 | -- | 24 | 10 | 69 | 24 | 28 | 6.1 | 264 | -- | 98 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 702 | -- | 21 | 20 | 67 | 23 | 26 | 4.9 | 259 | 0 | 88 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 568 | -- | 21 | 10 | 63 | 22 | 26 | 5.2 | 251 | 0 | 82 |
| JUNE | | | | | | | | | | | | |
| 01-09 | -- | 564 | -- | 24 | 20 | 65 | 23 | 27 | 6.0 | 265 | 0 | 88 |
| 11-30 | -- | 578 | -- | 25 | 10 | 69 | 25 | 29 | 6.6 | 285 | 0 | 96 |
| JULY | | | | | | | | | | | | |
| 01-31 | -- | 598 | -- | 24 | 10 | 69 | 25 | 25 | 5.6 | 282 | 0 | 94 |
| AUG. | | | | | | | | | | | | |
| 01-12 | -- | 230 | -- | 28 | 10 | 68 | 26 | 28 | 5.6 | 291 | 0 | 100 |
| 13-31 | -- | 356 | -- | 28 | 20 | 72 | 28 | 33 | 6.5 | 318 | 0 | 120 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 888 | -- | 24 | 0 | 67 | 25 | 29 | 5.5 | 283 | 0 | 90 |
| WTD. AVG. | -- | -- | -- | 23 | -- | 67 | 24 | 27 | 5.9 | 270 | 0 | 93 |
| TIME WTD. AVG. | -- | 626 | -- | 23 | -- | 67 | 24 | 27 | 5.9 | 272 | 0 | 94 |
| TONS PER DAY | -- | -- | -- | 39 | -- | 114 | 41 | 46 | 9.9 | 457 | 0 | 157 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV. | | | | | | | | | | | | |
| 05... | 1500 | 712 | 5.0 | 20 | 0 | 66 | 24 | 28 | 5.9 | 270 | 2 | 93 |
| FEB., 1971 | | | | | | | | | | | | |
| 04... | 1200 | 618 | 1.0 | 21 | 140 | 73 | 21 | 24 | 6.4 | 260 | 0 | 83 |
| MAR. | | | | | | | | | | | | |
| 30... | 1300 | 604 | 6.5 | 21 | 20 | 74 | 23 | 24 | 5.2 | 264 | -- | 96 |
| JUNE | | | | | | | | | | | | |
| 30... | 1225 | 928 | 13.5 | 27 | 40 | 72 | 27 | 27 | 6.6 | 296 | 0 | 100 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 03... | 1610 | 614 | .010 | -- | -- |
| NOV. | | | | | |
| 05... | 1500 | 712 | .010 | 50 | 15 |
| DEC. | | | | | |
| 03... | 1010 | 720 | .010 | -- | -- |
| JAN., 1971 | | | | | |
| 08... | 1455 | 660 | .000 | -- | -- |
| FEB. | | | | | |
| 04... | 1200 | 618 | .070 | -- | 100 |

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment concentrations: Maximum daily, 224 mg/l June 28; minimum daily, 18 mg/l May 29.
Sediment discharge: Maximum daily, 419 tons June 28; minimum daily, 15 tons May 29.

Period of record:
Dissolved solids: Maximum, 579 mg/l May 19-31, 1963; minimum, 338 mg/l Mar. 19, 20, 1963.
Hardness: Maximum, 362 mg/l Sept. 1-30, 1966; minimum, 213 mg/l Mar. 19, 20, 1963.
Specific conductance: Maximum daily, 896 micromhos June 23, 1963; minimum daily, 433 micromhos May 23, 1969.
Water temperatures: Maximum, 24.0°C on several days in 1966-1968, and 1970; minimum, freezing point on several days during winter period most years.
Sediment concentrations: Maximum daily, 670 mg/l June 8, 1964; minimum daily, 5 mg/l Sept. 22, 23, 1964.
Sediment discharge: Maximum daily, 1,200 tons June 8, 1964; minimum daily, 1.6 tons July 28, 1968.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Recorder removed Oct. 1 to July 26. Thermograph records furnished by Montana Fish and Game Department.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 15 | .5 | -- | -- | 411 | .56 | 670 | 280 | 48 | .7 | 636 | 7.7 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 14 | .6 | -- | -- | 394 | .57 | 817 | 280 | 60 | .7 | 602 | 8.2 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 13 | .4 | -- | -- | 377 | .53 | 714 | 260 | 45 | .7 | 585 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-23 | 14 | .7 | .20 | .10 | 370 | .50 | 573 | 280 | 59 | .6 | 615 | 8.1 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 14 | .4 | .20 | .03 | 373 | .51 | 686 | 240 | 43 | .8 | 599 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 14 | .7 | .10 | .00 | 394 | .54 | 650 | 270 | 55 | .7 | 636 | 8.3 |
| APR. | | | | | | | | | | | | |
| 01-30 | 12 | .4 | .19 | .06 | 371 | .50 | 703 | 260 | 50 | .7 | 600 | 8.1 |
| MAY | | | | | | | | | | | | |
| 01-31 | 12 | .4 | .08 | .06 | 355 | .48 | 544 | 250 | 42 | .7 | 571 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 01-09 | 14 | .5 | .04 | .03 | 378 | .51 | 576 | 260 | 40 | .7 | 583 | 7.8 |
| 11-30 | 15 | .6 | .12 | .06 | 407 | .55 | 635 | 280 | 41 | .8 | 613 | 7.8 |
| JULY | | | | | | | | | | | | |
| 01-31 | 15 | .8 | .05 | .09 | 397 | .54 | 641 | 280 | 44 | .7 | 629 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 01-12 | 11 | .4 | .13 | .03 | 411 | .56 | 255 | 280 | 38 | .7 | 646 | 8.3 |
| 13-31 | 12 | .4 | .19 | .03 | 457 | .62 | 439 | 290 | 34 | .8 | 708 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 15 | .6 | .24 | .06 | 396 | .54 | 949 | 270 | 38 | .8 | 622 | 8.3 |
| WTD. AVG. | 14 | .5 | -- | -- | 388 | .53 | -- | 268 | 47 | .7 | 613 | 8.1 |
| TIME WTD. AVG. | 14 | .5 | -- | -- | 390 | .54 | -- | 269 | 46 | .7 | 615 | 8.1 |
| TONS PER DAY | 23 | .9 | -- | -- | 656 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| NOV. | | | | | | | | | | | | |
| 05... | 14 | .6 | -- | -- | 387 | .54 | 759 | 260 | 39 | .8 | 597 | 8.4 |
| FEB., 1971 | | | | | | | | | | | | |
| 04... | 12 | .5 | .00 | .20 | 370 | .50 | 617 | 270 | 57 | .6 | 540 | 7.9 |
| MAR. | | | | | | | | | | | | |
| 30... | 12 | .6 | .40 | .09 | 388 | .53 | 633 | 280 | 63 | .6 | 578 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 30... | 14 | .5 | .52 | .09 | 422 | .57 | 1060 | 290 | 48 | .7 | 646 | 8.0 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| MAR. | | | | | |
| 04... | 1115 | 611 | .070 | -- | -- |
| 30... | 1300 | 604 | .050 | 60 | 48 |
| MAY | | | | | |
| 05... | 1410 | 756 | .070 | -- | -- |
| 28... | 1030 | 312 | .040 | 30 | -- |
| JUNE | | | | | |
| 30... | 1225 | 928 | .040 | 80 | 17 |
| AUG. | | | | | |
| 03... | 1545 | 211 | .070 | -- | -- |
| 31... | 1225 | 816 | .090 | -- | -- |

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 675 | 619 | 616 | 598 | 589 | 605 | 605 | 585 | 614 | 655 | 670 | 715 |
| 2 | 670 | 629 | 612 | 633 | 594 | 630 | 606 | 594 | 586 | 630 | 674 | 698 |
| 3 | 655 | 614 | 624 | 487 | 594 | 630 | 617 | 578 | 584 | 635 | 667 | 666 |
| 4 | 646 | 610 | 570 | 633 | 625 | 624 | 617 | 576 | 597 | 626 | 667 | 680 |
| 5 | 657 | 629 | 600 | 636 | 619 | 624 | 612 | 570 | 608 | 618 | --- | 674 |
| 6 | 685 | 629 | 619 | 622 | 619 | 630 | 618 | 549 | 610 | 622 | 670 | --- |
| 7 | 685 | 619 | 612 | 628 | 637 | 633 | 618 | 554 | 619 | 622 | 655 | 644 |
| 8 | 665 | 616 | 606 | 612 | 645 | 617 | 600 | 544 | 621 | 615 | 668 | 663 |
| 9 | 644 | 618 | 609 | 610 | 622 | --- | 608 | 553 | 639 | 591 | 667 | 637 |
| 10 | 655 | 618 | 595 | 610 | 625 | 618 | 606 | 565 | --- | 591 | 655 | 625 |
| 11 | 655 | 628 | 594 | 628 | 611 | 620 | 595 | 545 | 661 | 596 | 667 | 634 |
| 12 | 665 | 629 | 616 | 636 | 622 | 618 | 596 | 549 | 646 | 600 | 680 | 626 |
| 13 | 670 | 630 | 560 | 597 | 619 | 620 | 605 | 565 | 631 | 622 | 723 | 623 |
| 14 | 644 | 627 | 571 | 609 | 612 | 614 | 600 | 566 | 621 | 630 | 723 | 613 |
| 15 | 637 | 623 | 631 | 611 | 601 | 617 | --- | 564 | 614 | 654 | 735 | 621 |
| 16 | 629 | 616 | 629 | 621 | 601 | 614 | 584 | 565 | 616 | 654 | 752 | 613 |
| 17 | 631 | 623 | 609 | 621 | --- | 614 | 583 | 565 | 631 | 618 | 750 | 613 |
| 18 | 679 | 623 | 616 | 636 | 619 | 643 | 584 | 575 | 633 | 644 | 696 | 609 |
| 19 | 675 | 619 | 619 | 637 | 622 | 630 | 595 | 575 | 657 | 626 | 682 | 609 |
| 20 | 669 | 619 | 625 | 637 | 619 | 624 | 593 | 575 | 644 | 635 | 682 | 600 |
| 21 | 665 | 616 | 609 | 635 | --- | 614 | 584 | 577 | 649 | 664 | 682 | 612 |
| 22 | 659 | 615 | 616 | 633 | 626 | 605 | 588 | --- | 657 | 708 | 694 | 610 |
| 23 | 637 | 602 | 632 | 633 | 626 | 614 | 584 | 589 | 672 | 664 | 698 | --- |
| 24 | 642 | 629 | 632 | --- | 626 | 614 | --- | 600 | 661 | 649 | 696 | 608 |
| 25 | --- | 630 | --- | --- | 619 | 614 | 630 | 610 | 667 | 602 | 685 | 600 |
| 26 | 657 | 616 | 632 | --- | 636 | 611 | 600 | 601 | 674 | 627 | 694 | 612 |
| 27 | 660 | 623 | 631 | --- | 636 | 602 | 582 | 600 | 661 | 642 | 680 | 609 |
| 28 | 670 | 625 | 625 | --- | 640 | 581 | 583 | 600 | 661 | 655 | 680 | 612 |
| 29 | 670 | 619 | --- | --- | --- | 602 | 571 | 594 | 657 | 674 | --- | 610 |
| 30 | --- | 615 | 632 | --- | --- | 614 | 572 | 600 | 660 | 672 | 716 | 609 |
| 31 | 646 | --- | 632 | --- | --- | 604 | --- | 598 | --- | 686 | 785 | --- |
| MONTH | 659 | 621 | 613 | --- | 619 | 617 | 598 | 576 | 636 | 636 | 693 | 630 |
| YEAR | 626 | | | | | | | | | | | |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPEMBER 1971 (ONCE-DAILY RECORDS)

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9.5 | 4.5 | 2.5 | 1.0 | 6.0 | 2.0 | 6.0 | 9.5 | 11.0 | 14.5 | --- | --- |
| 2 | 9.5 | 4.0 | 2.0 | 0.0 | 5.0 | 3.0 | 5.0 | 11.0 | 10.0 | 15.5 | --- | --- |
| 3 | 9.5 | 3.0 | 1.5 | 0.0 | 4.5 | 4.0 | 7.0 | 10.0 | 11.5 | 14.5 | --- | --- |
| 4 | 10.0 | 2.0 | 1.5 | 0.0 | 2.0 | 4.0 | 8.0 | 10.0 | 11.5 | 13.5 | --- | --- |
| 5 | 11.0 | 5.0 | 1.0 | 0.0 | 1.0 | 4.0 | 9.0 | 10.0 | 12.0 | 14.0 | --- | --- |
| 6 | 7.5 | 5.5 | 3.0 | 0.0 | 0.5 | 3.5 | 10.0 | 11.0 | 12.5 | 14.0 | --- | --- |
| 7 | 5.0 | 5.0 | 4.0 | 0.5 | 3.0 | 4.0 | 7.0 | 9.5 | 13.0 | 13.0 | --- | --- |
| 8 | 6.5 | 5.0 | 4.0 | 1.0 | 4.0 | 5.5 | 9.0 | 10.5 | 14.0 | 13.5 | --- | --- |
| 9 | 8.0 | 5.0 | 4.0 | 2.0 | 3.0 | --- | 9.0 | 10.5 | 13.0 | 15.0 | --- | --- |
| 10 | 6.5 | 5.5 | 2.0 | 3.0 | 4.5 | 6.0 | 6.0 | 10.0 | --- | 17.0 | --- | --- |
| 11 | 7.0 | 4.5 | 1.0 | 0.5 | 5.0 | 6.5 | 6.5 | 10.5 | 13.0 | 16.5 | --- | --- |
| 12 | 9.5 | 4.5 | 0.0 | 0.0 | 5.5 | 6.0 | 8.0 | 11.0 | 14.0 | 17.0 | --- | --- |
| 13 | 7.0 | 5.0 | 0.0 | 0.5 | 5.0 | 5.0 | 8.0 | 12.0 | 13.5 | 17.0 | --- | --- |
| 14 | 6.0 | 4.0 | 0.5 | 0.5 | 6.0 | 4.5 | 9.5 | 9.0 | 14.0 | 16.0 | --- | --- |
| 15 | 5.5 | 3.5 | 1.0 | 1.5 | 5.5 | 5.0 | --- | 10.0 | 13.5 | 16.0 | --- | --- |
| 16 | 5.0 | 4.0 | 2.5 | 4.0 | 4.0 | 5.5 | 7.5 | 9.0 | 14.0 | 16.0 | --- | --- |
| 17 | 5.0 | 4.5 | 1.5 | 5.0 | --- | 4.5 | 7.0 | 8.5 | 13.5 | 17.0 | --- | --- |
| 18 | 5.0 | 4.5 | 0.0 | 5.0 | 5.0 | 4.5 | 7.0 | 8.5 | 13.0 | 17.0 | --- | --- |
| 19 | 6.0 | 3.0 | 0.0 | 5.5 | 5.0 | 5.0 | 8.5 | 9.0 | 13.0 | 17.0 | --- | --- |
| 20 | 5.5 | 4.0 | 0.0 | 4.5 | 3.0 | 5.5 | 8.5 | 8.5 | 14.0 | 17.0 | --- | --- |
| 21 | 7.0 | 3.0 | 0.0 | 2.0 | --- | 5.0 | 7.0 | 8.0 | 15.0 | 16.5 | --- | --- |
| 22 | 7.0 | 0.0 | 0.0 | 0.5 | 4.0 | 4.5 | 9.0 | --- | 15.0 | 16.0 | --- | --- |
| 23 | 5.0 | 1.0 | 0.0 | 1.5 | 4.5 | 5.5 | 11.5 | 8.0 | 16.0 | 16.5 | --- | --- |
| 24 | 6.0 | 3.0 | 0.0 | --- | 5.5 | 6.5 | --- | 11.5 | 15.0 | 17.0 | --- | --- |
| 25 | --- | 5.0 | --- | --- | 2.0 | 6.5 | 6.0 | 12.0 | 15.5 | 20.0 | --- | --- |
| 26 | 4.0 | 2.0 | 0.5 | --- | 2.0 | 7.5 | 6.5 | 14.0 | 14.0 | 16.0 | --- | --- |
| 27 | 3.0 | 2.0 | 0.5 | --- | 1.5 | 6.0 | 8.0 | 13.0 | 13.0 | --- | --- | --- |
| 28 | 3.0 | 2.0 | 0.0 | --- | 2.0 | 6.0 | 9.5 | 14.0 | 12.5 | --- | --- | --- |
| 29 | 3.0 | 3.0 | 0.0 | --- | --- | 8.0 | 8.0 | 13.0 | 11.0 | --- | --- | --- |
| 30 | --- | 4.0 | 1.0 | --- | --- | 8.0 | 11.5 | 12.0 | 17.0 | --- | --- | --- |
| 31 | 4.0 | --- | 2.0 | 6.5 | --- | 7.0 | --- | 10.5 | --- | --- | --- | --- |
| MONTH | 6.5 | 3.5 | 1.0 | --- | 4.0 | 5.5 | 8.0 | 10.5 | 13.5 | 16.0 | --- | --- |
| YEAR | 7.0 | | | | | | | | | | | |

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (THERMOGRAPH RECORD)

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 26 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 29 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MONTH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 16.0 | 16.5 | 14.5 |
| 2 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 16.5 | 15.5 | 14.5 |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- | 20.5 | 16.5 | 14.5 | 13.5 |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 16.5 | 15.5 | 12.0 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 16.5 | 16.5 | 13.5 |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 17.0 | 16.0 | 14.5 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 16.5 | 16.5 | 14.0 |
| 8 | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 18.0 | 16.0 | 13.5 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 16.5 | 16.5 | 14.0 |
| 10 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 16.0 | 16.5 | 14.0 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 16.5 | 16.5 | 14.5 |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 16.5 | 16.0 | 13.5 |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 15.5 | 16.0 | 14.0 |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 16.5 | 15.0 | 13.0 |
| 15 | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 15.5 | 13.5 | 11.0 |
| 16 | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 15.0 | 12.0 | 10.5 |
| 17 | --- | --- | --- | --- | --- | --- | --- | --- | 19.0 | 15.5 | 12.0 | 10.0 |
| 18 | --- | --- | --- | --- | --- | --- | --- | --- | 19.5 | 14.5 | 11.5 | 9.0 |
| 19 | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 15.5 | 11.5 | 10.0 |
| 20 | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 15.5 | 11.5 | 10.0 |
| 21 | --- | --- | --- | --- | --- | --- | --- | --- | 19.5 | 14.5 | 11.5 | 9.0 |
| 22 | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 15.5 | 12.0 | 9.5 |
| 23 | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 14.5 | 13.0 | 10.0 |
| 24 | --- | --- | --- | --- | --- | --- | --- | --- | 18.0 | 14.0 | 13.0 | 10.5 |
| 25 | --- | --- | --- | --- | --- | --- | --- | --- | 17.0 | 14.5 | 12.0 | 11.0 |
| 26 | --- | --- | --- | --- | --- | --- | --- | --- | 19.5 | 15.0 | 11.0 | 10.0 |
| 27 | --- | --- | --- | --- | --- | --- | 21.0 | 16.0 | 19.5 | 15.5 | 11.5 | 9.5 |
| 28 | --- | --- | --- | --- | --- | --- | 18.5 | 16.0 | 19.5 | 16.0 | 10.5 | 9.0 |
| 29 | --- | --- | --- | --- | --- | --- | 20.0 | 15.0 | 18.5 | 15.0 | 9.0 | 8.5 |
| 30 | --- | --- | --- | --- | --- | --- | 21.0 | 15.5 | 18.5 | 15.0 | 9.0 | 8.5 |
| 31 | --- | --- | --- | --- | --- | --- | 21.0 | 16.0 | 18.5 | 16.0 | --- | --- |
| MONTH | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 14.0 | 16.5 | 8.5 |
| YEAR | 22.0 | 8.5 | | | | | | | | | | |

MISSOURI RIVER MAIN STEM

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 646 | 32 | 56 | 680 | 98 | 180 | 757 | 81 | 166 |
| 2 | 618 | 26 | 43 | 687 | 109 | 202 | 722 | 75 | 146 |
| 3 | 614 | 33 | 55 | 693 | 83 | 155 | 722 | 81 | 158 |
| 4 | 608 | 37 | 61 | 684 | 83 | 153 | 709 | 114 | 218 |
| 5 | 600 | 30 | 49 | 704 | 86 | 163 | 695 | 78 | 146 |
| 6 | 519 | 21 | 29 | 716 | 81 | 157 | 704 | 61 | 116 |
| 7 | 566 | 19 | 29 | 724 | 77 | 151 | 736 | 92 | 183 |
| 8 | 594 | 29 | 47 | 725 | 83 | 162 | 742 | 87 | 174 |
| 9 | 613 | 42 | 70 | 728 | 75 | 147 | 737 | 100 | 199 |
| 10 | 629 | 96 | 163 | 752 | 76 | 154 | 738 | 101 | 201 |
| 11 | 637 | 87 | 150 | 741 | 86 | 172 | 710 | 95 | 182 |
| 12 | 637 | 98 | 169 | 736 | 87 | 173 | 676 | 85 | 155 |
| 13 | 656 | 96 | 170 | 738 | 91 | 181 | 637 | 78 | 134 |
| 14 | 660 | 89 | 159 | 735 | 77 | 153 | 661 | 77 | 137 |
| 15 | 721 | 77 | 150 | 722 | 75 | 146 | 676 | 83 | 151 |
| 16 | 756 | 75 | 153 | 726 | 71 | 139 | 688 | 78 | 145 |
| 17 | 747 | 79 | 159 | 737 | 70 | 139 | 693 | 72 | 135 |
| 18 | 564 | 83 | 126 | 741 | 67 | 134 | 662 | 86 | 154 |
| 19 | 536 | 89 | 129 | 742 | 67 | 134 | 609 | 83 | 136 |
| 20 | 521 | 82 | 115 | 736 | 78 | 155 | 636 | 80 | 137 |
| 21 | 508 | 88 | 121 | 733 | 65 | 129 | 688 | 88 | 163 |
| 22 | 507 | 83 | 114 | 672 | 57 | 103 | 655 | 80 | 141 |
| 23 | 617 | 77 | 128 | 676 | 49 | 89 | 640 | 49 | 85 |
| 24 | 668 | 87 | 157 | 718 | 51 | 99 | 641 | 50 | 87 |
| 25 | 669 | 86 | 155 | 768 | 54 | 112 | 641 | 53 | 92 |
| 26 | 675 | 68 | 124 | 758 | 49 | 100 | 618 | 46 | 77 |
| 27 | 567 | 64 | 98 | 738 | 49 | 98 | 655 | 33 | 58 |
| 28 | 517 | 71 | 99 | 723 | 46 | 90 | 659 | 47 | 84 |
| 29 | 482 | 63 | 82 | 730 | 39 | 77 | 684 | 124 | 229 |
| 30 | 498 | 69 | 93 | 747 | 65 | 131 | 645 | 64 | 111 |
| 31 | 609 | 87 | 143 | -- | -- | -- | 635 | 67 | 115 |
| TOTAL | 18759 | -- | 3396 | 21710 | -- | 4178 | 21071 | -- | 4415 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 604 | 71 | 116 | 721 | 118 | 230 | 610 | 71 | 117 |
| 2 | 564 | 50 | 76 | 741 | 83 | 166 | 606 | 66 | 108 |
| 3 | 574 | 60 | 93 | 715 | 62 | 120 | 611 | 98 | 162 |
| 4 | 557 | 71 | 107 | 633 | 51 | 87 | 617 | 110 | 183 |
| 5 | 544 | 53 | 78 | 677 | 78 | 143 | 624 | 107 | 180 |
| 6 | 577 | 67 | 104 | 671 | 92 | 167 | 614 | 106 | 176 |
| 7 | 584 | 57 | 90 | 681 | 97 | 178 | 617 | 100 | 167 |
| 8 | 613 | 71 | 118 | 671 | 113 | 205 | 609 | 98 | 161 |
| 9 | 616 | 204 | 339 | 665 | 102 | 183 | 627 | 98 | 166 |
| 10 | 603 | 103 | 168 | 674 | 104 | 189 | 536 | 98 | 142 |
| 11 | 555 | 85 | 127 | 681 | 107 | 197 | 465 | 111 | 139 |
| 12 | 549 | 60 | 89 | 690 | 112 | 209 | 543 | 113 | 166 |
| 13 | 543 | 43 | 63 | 715 | 128 | 247 | 650 | 120 | 211 |
| 14 | 536 | 46 | 67 | 718 | 113 | 219 | 642 | 101 | 175 |
| 15 | 578 | 44 | 69 | 735 | 88 | 175 | 636 | 91 | 156 |
| 16 | 568 | 67 | 103 | 729 | 91 | 179 | 635 | 87 | 149 |
| 17 | 576 | 54 | 84 | 716 | 115 | 222 | 635 | 84 | 144 |
| 18 | 577 | 56 | 87 | 698 | 133 | 251 | 533 | 94 | 135 |
| 19 | 584 | 50 | 79 | 698 | 112 | 211 | 450 | 81 | 98 |
| 20 | 601 | 104 | 169 | 684 | 84 | 155 | 538 | 89 | 129 |
| 21 | 573 | 118 | 183 | 658 | 77 | 137 | 632 | 76 | 130 |
| 22 | 538 | 104 | 151 | 645 | 76 | 132 | 634 | 93 | 159 |
| 23 | 577 | 165 | 257 | 652 | 79 | 139 | 636 | 87 | 149 |
| 24 | 573 | 103 | 159 | 667 | 79 | 142 | 634 | 83 | 142 |
| 25 | 576 | 107 | 166 | 677 | 77 | 141 | 639 | 75 | 129 |
| 26 | 576 | 96 | 149 | 639 | 54 | 93 | 645 | 79 | 138 |
| 27 | 585 | 118 | 186 | 616 | 79 | 131 | 667 | 70 | 126 |
| 28 | 583 | 102 | 161 | 609 | 74 | 122 | 713 | 71 | 137 |
| 29 | 585 | 113 | 178 | -- | -- | -- | 682 | 74 | 136 |
| 30 | 616 | 97 | 161 | -- | -- | -- | 613 | 65 | 108 |
| 31 | 639 | 99 | 171 | -- | -- | -- | 656 | 78 | 138 |
| TOTAL | 17924 | -- | 4148 | 19076 | -- | 4770 | 18949 | -- | 4556 |

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 686 | 120 | 222 | 755 | 88 | 179 | 488 | 89 | 117 |
| 2 | 665 | 125 | 224 | 684 | 76 | 140 | 578 | 103 | 161 |
| 3 | 651 | 116 | 204 | 673 | 78 | 142 | 629 | 102 | 173 |
| 4 | 645 | 107 | 186 | 705 | 78 | 148 | 634 | 106 | 181 |
| 5 | 643 | 107 | 186 | 764 | 76 | 157 | 599 | 74 | 120 |
| 6 | 624 | 112 | 189 | 778 | 77 | 162 | 574 | 65 | 101 |
| 7 | 614 | 119 | 197 | 771 | 73 | 152 | 537 | 101 | 146 |
| 8 | 717 | 116 | 225 | 752 | 65 | 132 | 501 | 79 | 107 |
| 9 | 768 | 93 | 193 | 682 | 62 | 114 | 539 | 104 | 151 |
| 10 | 761 | 113 | 232 | 681 | 67 | 123 | 582 | 118 | 185 |
| 11 | 784 | 121 | 256 | 649 | 69 | 121 | 696 | 123 | 231 |
| 12 | 754 | 100 | 204 | 601 | 68 | 110 | 842 | 94 | 214 |
| 13 | 716 | 92 | 178 | 585 | 71 | 112 | 843 | 51 | 116 |
| 14 | 659 | 100 | 178 | 566 | 63 | 96 | 795 | 130 | 279 |
| 15 | 667 | 95 | 171 | 589 | 62 | 99 | 726 | 102 | 200 |
| 16 | 651 | 77 | 135 | 599 | 49 | 79 | 610 | 90 | 148 |
| 17 | 614 | 68 | 113 | 588 | 51 | 81 | 549 | 88 | 130 |
| 18 | 645 | 69 | 120 | 576 | 56 | 87 | 512 | 91 | 126 |
| 19 | 649 | 61 | 107 | 591 | 55 | 88 | 445 | 91 | 109 |
| 20 | 662 | 76 | 136 | 552 | 44 | 66 | 406 | 92 | 101 |
| 21 | 680 | 70 | 129 | 526 | 35 | 50 | 418 | 98 | 111 |
| 22 | 671 | 64 | 116 | 557 | 33 | 50 | 389 | 87 | 91 |
| 23 | 674 | 59 | 107 | 517 | 35 | 49 | 355 | 81 | 78 |
| 24 | 707 | 81 | 155 | 420 | 37 | 42 | 327 | 70 | 62 |
| 25 | 874 | 118 | 278 | 382 | 29 | 30 | 309 | 58 | 48 |
| 26 | 812 | 62 | 136 | 371 | 26 | 26 | 335 | 62 | 56 |
| 27 | 788 | 71 | 151 | 343 | 26 | 24 | 483 | 62 | 81 |
| 28 | 751 | 64 | 130 | 316 | 19 | 16 | 692 | 224 | 419 |
| 29 | 744 | 98 | 197 | 306 | 18 | 15 | 890 | 119 | 286 |
| 30 | 778 | 115 | 242 | 322 | 30 | 26 | 929 | 91 | 228 |
| 31 | -- | -- | -- | 403 | 56 | 61 | -- | -- | -- |
| TOTAL | 21054 | -- | 5297 | 17604 | -- | 2777 | 17212 | -- | 4556 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 894 | 98 | 237 | 236 | 34 | 22 | 760 | 143 | 293 |
| 2 | 928 | 128 | 321 | 233 | 32 | 20 | 722 | 152 | 296 |
| 3 | 904 | 118 | 288 | 209 | 32 | 18 | 768 | 132 | 274 |
| 4 | 905 | 109 | 266 | 208 | 67 | 38 | 854 | 122 | 281 |
| 5 | 950 | 107 | 274 | 209 | 87 | 49 | 886 | 125 | 299 |
| 6 | 944 | 98 | 250 | 234 | 90 | 57 | 875 | 110 | 260 |
| 7 | 892 | 98 | 236 | 254 | 80 | 55 | 899 | 115 | 279 |
| 8 | 813 | 90 | 198 | 265 | 73 | 52 | 957 | 132 | 341 |
| 9 | 809 | 98 | 214 | 261 | 78 | 55 | 925 | 115 | 287 |
| 10 | 800 | 95 | 205 | 225 | 68 | 41 | 911 | 101 | 248 |
| 11 | 821 | 76 | 168 | 226 | 75 | 46 | 893 | 95 | 229 |
| 12 | 780 | 48 | 101 | 195 | 76 | 40 | 853 | 99 | 228 |
| 13 | 675 | 57 | 104 | 162 | 85 | 37 | 869 | 99 | 232 |
| 14 | 517 | 62 | 87 | 149 | 85 | 34 | 855 | 93 | 215 |
| 15 | 434 | 64 | 75 | 154 | 82 | 34 | 847 | 92 | 210 |
| 16 | 468 | 67 | 85 | 162 | 69 | 30 | 874 | 77 | 182 |
| 17 | 526 | 57 | 81 | 167 | 95 | 43 | 901 | 84 | 204 |
| 18 | 475 | 47 | 60 | 242 | 104 | 68 | 905 | 89 | 217 |
| 19 | 512 | 43 | 59 | 324 | 94 | 82 | 915 | 83 | 205 |
| 20 | 499 | 44 | 59 | 340 | 60 | 55 | 926 | 67 | 168 |
| 21 | 436 | 47 | 55 | 286 | 64 | 49 | 962 | 45 | 117 |
| 22 | 365 | 82 | 81 | 288 | 64 | 50 | 965 | 55 | 143 |
| 23 | 406 | 62 | 68 | 362 | 69 | 67 | 949 | 63 | 161 |
| 24 | 395 | 41 | 44 | 400 | 71 | 77 | 941 | 62 | 158 |
| 25 | 368 | 32 | 32 | 425 | 67 | 77 | 923 | 62 | 155 |
| 26 | 372 | 46 | 46 | 459 | 66 | 82 | 920 | 66 | 164 |
| 27 | 325 | 52 | 46 | 445 | 56 | 67 | 905 | 63 | 154 |
| 28 | 364 | 51 | 50 | 441 | 48 | 57 | 892 | 47 | 113 |
| 29 | 373 | 38 | 38 | 472 | 64 | 82 | 885 | 45 | 108 |
| 30 | 316 | 51 | 44 | 673 | 95 | 173 | 910 | 45 | 111 |
| 31 | 259 | 33 | 23 | 805 | 102 | 222 | -- | -- | -- |
| TOTAL | 18525 | -- | 3895 | 9511 | -- | 1879 | 26647 | -- | 6332 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 228042
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 50199

## 06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.

LOCATION.--Lat 45°41'10", long 112°16'59", in SE¼SW¼SE¼ sec.1, T.2 S., R.6 W., Madison County, at county bridge 6.5 miles downstream from gaging station, 10.5 miles downstream from confluence of Beaverhead and Big Hole Rivers, and 10 miles north of Twin Bridges.

DRAINAGE AREA.--7,632 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: September 1957 to September 1959, August 1960 to September 1962, July 1965 to September 1971.
Water temperatures: March 1958 to September 1959, August 1960 to September 1962, July 1965 to September 1971.
Sediment records: October 1957 to September 1959, August 1960 to September 1962, July 1965 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 354 mg/l Aug. 17-31; minimum, 108 mg/l May 22-31.
Hardness: Maximum, 250 mg/l Jan. 1-14, Aug. 17-31; minimum, 69 mg/l May 11-21.
Specific conductance: Maximum daily, 674 micromhos Aug. 31; minimum daily, 136 micromhos May 30.
Water temperatures: Maximum observed, 24.5°C Aug. 13; minimum, freezing point on several days during November to March.
Sediment concentrations: Maximum daily, 414 mg/l May 8; minimum daily, 4 mg/l Nov. 5.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 1620 | -- | 20 | -- | 55 | 19 | 22 | 5.1 | 226 | 0 | 74 |
| NOV. | | | | | | | | | | | | |
| 01-14 | -- | 1730 | -- | 22 | -- | 54 | 19 | 21 | 5.3 | 218 | 0 | 72 |
| 15-30 | -- | 1710 | -- | 21 | -- | 57 | 19 | 21 | 5.1 | 218 | 0 | 73 |
| DEC. | | | | | | | | | | | | |
| 01-13 | -- | 1630 | -- | 19 | -- | 55 | 18 | 20 | 4.4 | 211 | 0 | 73 |
| 14-31 | -- | 1410 | -- | 20 | -- | 57 | 20 | 21 | 4.9 | 227 | 0 | 77 |
| JAN. | | | | | | | | | | | | |
| 01-14 | -- | 1290 | -- | 23 | 80 | 64 | 21 | 23 | 5.1 | 231 | 0 | 81 |
| 15-31 | -- | 1390 | -- | 22 | 70 | 50 | 18 | 19 | 4.8 | 210 | 0 | 50 |
| FEB. | | | | | | | | | | | | |
| 01-15 | -- | 1820 | -- | 21 | 30 | 47 | 16 | 18 | 5.7 | 191 | -- | 62 |
| 16-28 | -- | 1540 | -- | 22 | 10 | 52 | 18 | 22 | 5.2 | 194 | 9 | 71 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 1350 | -- | 21 | 60 | 52 | 18 | 22 | 5.1 | 231 | -- | 65 |
| APR. | | | | | | | | | | | | |
| 01-20 | -- | 2180 | -- | 19 | 40 | 41 | 14 | 14 | 4.2 | 161 | 0 | 50 |
| 21-30 | -- | 3430 | -- | 9.3 | 120 | 33 | 9.6 | 13 | 3.7 | 124 | 0 | 37 |
| MAY | | | | | | | | | | | | |
| 01-10 | -- | 5720 | -- | 17 | 60 | 23 | 6.5 | 8.9 | 3.0 | 104 | 0 | 26 |
| 11-21 | -- | 7950 | -- | 16 | 70 | 19 | 5.2 | 6.9 | 2.3 | 83 | 0 | 20 |
| 22-31 | -- | 5620 | -- | 16 | 60 | 19 | 5.5 | 7.1 | 2.2 | 79 | 0 | 17 |
| JUNE | | | | | | | | | | | | |
| 01-11 | -- | 8290 | -- | 15 | 40 | 21 | 5.6 | 7.0 | 2.0 | 94 | 0 | 21 |
| 12-30 | -- | 7520 | -- | 16 | 40 | 24 | 7.1 | 8.6 | 2.4 | 113 | 0 | 24 |
| JULY | | | | | | | | | | | | |
| 01-08 | -- | 4980 | -- | 19 | 10 | 36 | 12 | 12 | 3.4 | 156 | 0 | 42 |
| 09-31 | -- | 2270 | -- | 18 | 10 | 40 | 13 | 14 | 3.7 | 170 | 0 | 48 |
| AUG. | | | | | | | | | | | | |
| 01-16 | -- | 1160 | -- | 19 | 10 | 45 | 15 | 15 | 3.4 | 185 | 0 | 59 |
| 17-31 | -- | 1070 | -- | 23 | 10 | 63 | 22 | 21 | 5.1 | 249 | 0 | 87 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 1640 | -- | 23 | 0 | 56 | 22 | 25 | 4.5 | 241 | 0 | 82 |
| WTD. AVG. | -- | -- | -- | 18 | -- | 37 | 12 | 14 | 3.6 | 154 | 0 | 45 |
| TIME WTD. AVG. | -- | 2650 | -- | 20 | -- | 46 | 16 | 18 | 4.3 | 190 | 0 | 59 |
| TONS PER DAY | -- | -- | -- | 129 | -- | 263 | 86 | 99 | 25 | 1100 | 2 | 319 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV. | | | | | | | | | | | | |
| 06... | 1220 | 1710 | 4.5 | 19 | 10 | 54 | 19 | 22 | 5.0 | 212 | 7 | 73 |
| FEB., 1971 | | | | | | | | | | | | |
| 04... | 1630 | 1780 | 2.5 | 18 | 240 | 42 | 15 | 17 | 4.9 | 174 | 0 | 54 |
| MAR. | | | | | | | | | | | | |
| 29... | 1530 | 1530 | 6.5 | 19 | 40 | 54 | 17 | 18 | 4.5 | 208 | -- | 69 |
| JUNE | | | | | | | | | | | | |
| 04... | 1315 | 8580 | 11.5 | 16 | -- | -- | -- | 30 | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 02... | 1245 | 5600 | 15.5 | 19 | 120 | 36 | 12 | 13 | 3.1 | 145 | 0 | 37 |

06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment discharge: Maximum daily, 7,800 tons May 8; minimum daily, 18 tons Nov. 5.

Period of record:
Dissolved solids: Maximum, 455 mg/l Sept. 1-30, 1969; minimum, 93 mg/l June 1-14, 1959.
Hardness: Maximum, 311 mg/l Aug. 24-31, 1969; minimum, 49 mg/l May 11-31, 1958.
Specific conductance: Maximum daily, 749 micromhos Sept. 23, 1969; minimum daily, 102 micromhos May 23, 1958.
Water temperatures (1958-59, 1960-62, 1965-71): Maximum observed, 25.5°C July 16, 1959; minimum, freezing point on many days during winter period most years.
Sediment concentrations: Maximum daily, 1,300 mg/l Oct. 24, 1961; minimum daily, 2 mg/l July 19, 1966, Aug. 13, 1967.
Sediment discharge: Maximum daily, 7,800 tons May 8, 1971; minimum daily, 2 tons July 19, 1966.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Dissolved solids, 490 mg/l Feb. 4. Flow affected by ice on several days during winter period. Prior to January 1970, sampling site was 4 miles upstream.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 11 | .3 | -- | -- | 319 | .43 | 1380 | 220 | 31 | .7 | 488 | 8.2 |
| NOV. | | | | | | | | | | | | |
| 01-14 | 9.6 | .6 | -- | -- | 311 | .45 | 1540 | 210 | 32 | .6 | 491 | 8.1 |
| 15-30 | 9.2 | .6 | -- | -- | 313 | .45 | 1520 | 220 | 41 | .6 | 490 | 8.1 |
| DEC. | | | | | | | | | | | | |
| 01-13 | 9.8 | .4 | -- | -- | 303 | .41 | 1330 | 210 | 38 | .6 | 473 | 8.1 |
| 14-31 | 10 | .2 | -- | -- | 323 | .44 | 1220 | 220 | 38 | .6 | 496 | 8.1 |
| JAN. | | | | | | | | | | | | |
| 01-14 | 11 | 1.3 | .10 | .00 | 340 | .46 | 1180 | 250 | 61 | .6 | 528 | 8.3 |
| 15-31 | 9.5 | .5 | .10 | .00 | 280 | .38 | 1050 | 200 | 28 | .6 | 476 | 8.2 |
| FEB. | | | | | | | | | | | | |
| 01-15 | 8.7 | .3 | .10 | .00 | 273 | .37 | 1340 | 180 | 27 | .6 | 438 | 8.3 |
| 16-28 | 9.4 | .4 | .20 | .12 | 314 | .43 | 1310 | 200 | 30 | .7 | 482 | 8.4 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 9.4 | .3 | .10 | .00 | 307 | .42 | 1120 | 200 | 14 | .7 | 492 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01-20 | 5.7 | .3 | .03 | .09 | 228 | .31 | 1340 | 160 | 28 | .5 | 367 | 8.0 |
| 21-30 | 4.4 | .2 | .12 | .12 | 172 | .23 | 1590 | 120 | 20 | .5 | 294 | 8.0 |
| MAY | | | | | | | | | | | | |
| 01-10 | 3.0 | .2 | .00 | .06 | 139 | .19 | 2150 | 84 | 0 | .4 | 217 | 7.6 |
| 11-21 | 2.0 | .2 | .00 | .03 | 113 | .15 | 2430 | 69 | 1 | .4 | 175 | 7.6 |
| 22-31 | 2.2 | .2 | .00 | .06 | 108 | .15 | 1640 | 70 | 5 | .4 | 176 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 01-11 | 2.6 | .4 | .01 | .06 | 121 | .16 | 2710 | 75 | 0 | .4 | 184 | 7.3 |
| 12-30 | 2.6 | .5 | .00 | .03 | 141 | .19 | 2860 | 89 | 0 | .4 | 220 | 7.6 |
| JULY | | | | | | | | | | | | |
| 01-08 | 5.0 | .5 | .01 | .03 | 207 | .28 | 2780 | 140 | 11 | .4 | 332 | 8.1 |
| 09-31 | 6.1 | .5 | .00 | .03 | 227 | .31 | 1390 | 150 | 14 | .5 | 359 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 01-16 | 4.6 | .3 | .00 | .03 | 252 | .34 | 789 | 170 | 22 | .5 | 403 | 8.2 |
| 17-31 | 9.7 | .3 | .04 | .00 | 354 | .48 | 1020 | 250 | 44 | .6 | 567 | 8.1 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 12 | .5 | .04 | .03 | 344 | .47 | 1520 | 230 | 33 | .7 | 549 | 8.3 |
| WTD. AVG. | 5.8 | .4 | -- | -- | 211 | .29 | -- | 141 | 16 | .5 | 334 | 7.9 |
| TIME WTD. AVG. | 7.8 | .4 | -- | -- | 265 | .36 | -- | 180 | 25 | .6 | 420 | 8.1 |
| TONS PER DAY | 41 | 2.8 | -- | -- | 1510 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV. | | | | | | | | | | | | |
| 06... | 9.9 | .5 | -- | -- | 314 | .43 | 1450 | 210 | 26 | .7 | 490 | 8.4 |
| FEB., 1971 | | | | | | | | | | | | |
| 04... | 7.2 | .4 | .00 | .20 | 490 | .67 | 2360 | 170 | 27 | .6 | 365 | 7.7 |
| MAR. | | | | | | | | | | | | |
| 29... | 7.8 | .5 | .30 | .03 | 294 | .40 | 1210 | 200 | 34 | .5 | 441 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 04... | 40 | -- | .07 | .12 | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 02... | 4.3 | .5 | .05 | .09 | 197 | .27 | 2980 | 140 | 20 | .5 | 315 | 7.9 |

06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 09... | 1335 | 1580 | .010 | -- | -- |
| NOV. | | | | | |
| 06... | 1220 | 1710 | .000 | 40 | 17 |
| DEC. | | | | | |
| 03... | 1500 | 1600 | .020 | -- | -- |
| JAN., 1971 | | | | | |
| 07... | 1300 | 1350 | .010 | -- | -- |
| FEB. | | | | | |
| 04... | 1630 | 1780 | .070 | -- | 100 |
| MAR. | | | | | |
| 04... | 1600 | 1330 | .070 | -- | -- |
| 29... | 1530 | 1530 | .050 | 130 | 21 |
| MAY | | | | | |
| 04... | 1810 | 5190 | .080 | -- | -- |
| JUNE | | | | | |
| 04... | 1315 | 8580 | .050 | -- | -- |
| JULY | | | | | |
| 02... | 1245 | 5600 | .050 | 50 | 0 |
| AUG. | | | | | |
| 03... | 1155 | 1210 | .070 | -- | -- |
| 30... | 1510 | 1380 | .040 | 90 | -- |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 501 | 479 | 479 | 498 | 407 | 511 | 392 | 269 | 159 | 307 | 384 | 667 |
| 2 | 501 | 485 | 480 | 513 | 345 | 504 | 397 | 246 | 168 | 320 | 384 | 619 |
| 3 | 509 | 487 | 471 | 548 | 387 | 504 | 398 | 242 | 176 | 322 | 382 | 588 |
| 4 | 504 | 492 | 488 | 557 | 396 | 485 | 406 | 227 | 191 | 327 | 375 | 586 |
| 5 | 509 | 485 | 491 | 557 | 426 | 491 | 409 | 222 | 188 | 333 | 377 | 577 |
| 6 | 515 | 487 | 483 | 559 | 448 | 502 | 412 | 209 | 192 | 347 | 386 | 596 |
| 7 | 521 | 482 | 485 | 509 | 439 | 497 | 385 | 208 | 189 | 351 | 391 | 564 |
| 8 | 508 | 476 | 472 | 493 | 440 | 486 | 370 | 193 | 192 | 355 | 394 | 593 |
| 9 | 507 | 474 | 465 | 495 | 450 | 486 | 382 | 206 | 189 | 369 | 394 | 565 |
| 10 | 493 | 478 | 471 | 485 | 462 | 470 | 366 | 195 | 187 | 365 | 397 | 566 |
| 11 | 491 | 479 | 487 | 498 | 440 | 464 | 353 | 185 | 189 | 365 | 405 | 565 |
| 12 | 492 | 489 | 495 | 608 | 438 | 463 | 368 | 183 | 202 | 369 | 435 | 561 |
| 13 | 496 | 489 | 450 | 592 | 441 | 474 | 385 | 181 | 215 | 355 | 438 | 567 |
| 14 | 483 | 485 | 512 | --- | 432 | 485 | 392 | 167 | 191 | 355 | 455 | 564 |
| 15 | 478 | 502 | 503 | 475 | 431 | 487 | 403 | 155 | 213 | 347 | 461 | 556 |
| 16 | 483 | 502 | 502 | 529 | 450 | 493 | 316 | 155 | 213 | 347 | 475 | 539 |
| 17 | 477 | 503 | 503 | 466 | 452 | 495 | 318 | 154 | 209 | 350 | 509 | 539 |
| 18 | 484 | 485 | 491 | 476 | 451 | 491 | 322 | 158 | 213 | 351 | 508 | 545 |
| 19 | 484 | 477 | 510 | 446 | 452 | 469 | 354 | 171 | 213 | 348 | 522 | 555 |
| 20 | 486 | 493 | 494 | 480 | 473 | 482 | 354 | 178 | 213 | 370 | 537 | 526 |
| 21 | 477 | 501 | 532 | 482 | 489 | 486 | 307 | 182 | 213 | 362 | 537 | 542 |
| 22 | 476 | 502 | 499 | 504 | 493 | 487 | 304 | 193 | 209 | 356 | 550 | 545 |
| 23 | 477 | 557 | 494 | 503 | 488 | 487 | 292 | 206 | 213 | 356 | 555 | 524 |
| 24 | 480 | 530 | 522 | 480 | 480 | 486 | 260 | 202 | 203 | 355 | 567 | 546 |
| 25 | 483 | 498 | 478 | 482 | 489 | 486 | 262 | 206 | 215 | 353 | 577 | --- |
| 26 | 491 | 493 | 505 | 482 | 505 | 470 | 260 | 202 | 233 | 354 | 565 | 536 |
| 27 | 477 | 450 | 522 | 475 | 497 | 470 | 286 | 182 | 224 | 353 | 571 | 535 |
| 28 | 480 | 450 | 528 | 474 | 503 | 462 | 286 | 163 | 248 | 378 | 567 | 520 |
| 29 | 480 | 465 | 517 | 478 | --- | 454 | 304 | 155 | 242 | 392 | 600 | 507 |
| 30 | 484 | 455 | 519 | 474 | --- | 449 | 302 | 136 | 271 | 386 | 600 | 503 |
| 31 | 485 | --- | 505 | 459 | --- | 421 | --- | 141 | --- | 380 | 674 | --- |
| MONTH | 491 | 488 | 495 | 503 | 450 | 481 | 345 | 189 | 206 | 354 | 483 | 558 |
| YEAR | 420 | | | | | | | | | | | |

06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.0 | 6.0 | 2.0 | 2.0 | 5.0 | 0.0 | 7.0 | 12.5 | 12.5 | 18.0 | 21.0 | 15.0 |
| 2 | 15.0 | 5.5 | 1.5 | 1.0 | 4.0 | 1.0 | 7.0 | 12.5 | 14.0 | 15.0 | 21.0 | 15.5 |
| 3 | 14.0 | 5.0 | 0.5 | 0.5 | 3.5 | 3.0 | 8.0 | 13.0 | 12.0 | 18.0 | 19.0 | 13.5 |
| 4 | 16.0 | 4.0 | 1.0 | 0.5 | 1.0 | 2.0 | 8.5 | 12.5 | 12.0 | 15.0 | 23.5 | 14.5 |
| 5 | 12.0 | 4.0 | 2.0 | 0.0 | 1.0 | 3.0 | 8.5 | 12.5 | 13.0 | 18.5 | 22.5 | 19.5 |
| 6 | 7.0 | 4.5 | 2.5 | 0.0 | 0.0 | 2.0 | 10.0 | 12.5 | 14.0 | 17.5 | 24.0 | 18.0 |
| 7 | 7.0 | 6.5 | 4.0 | 0.0 | 0.5 | 3.5 | 8.0 | 12.5 | 16.0 | 17.5 | 24.0 | 17.0 |
| 8 | 8.5 | 5.5 | 4.0 | 0.0 | 1.0 | 4.5 | 8.5 | 13.0 | 14.5 | 18.0 | 22.5 | 17.0 |
| 9 | 8.0 | 6.0 | 2.0 | 0.5 | 1.5 | 5.0 | 7.0 | 11.0 | 16.0 | 18.5 | 22.0 | 17.5 |
| 10 | 8.0 | 5.0 | 0.5 | 1.0 | 5.0 | 5.0 | 6.0 | 11.5 | 15.5 | 18.0 | 23.5 | 18.0 |
| 11 | 9.5 | 4.0 | 0.5 | 1.5 | 4.5 | 6.0 | 5.5 | 10.5 | 15.5 | 18.0 | 23.0 | 17.0 |
| 12 | 9.5 | 4.5 | 0.0 | 1.5 | 4.0 | 4.5 | 7.0 | 13.5 | 17.0 | 15.5 | 24.0 | 16.0 |
| 13 | 9.0 | 5.5 | 0.0 | 3.0 | 3.5 | 4.5 | 8.0 | 12.0 | 15.0 | 19.0 | 24.5 | 17.0 |
| 14 | 9.0 | 4.5 | 0.0 | 3.0 | 4.5 | 5.0 | 10.0 | 13.0 | 17.5 | 20.0 | 23.0 | 15.0 |
| 15 | 9.0 | 4.5 | 0.5 | 3.5 | 5.5 | 5.0 | 8.0 | 12.0 | 16.0 | 21.5 | 22.5 | 12.0 |
| 16 | 8.5 | 5.0 | 1.0 | 4.0 | 4.0 | 4.0 | 7.0 | 11.5 | 17.0 | 21.0 | 22.0 | 11.0 |
| 17 | 8.5 | 4.5 | 1.0 | 4.0 | 3.0 | 3.0 | 6.0 | 10.0 | 16.0 | 22.5 | 20.0 | 11.0 |
| 18 | 8.0 | 5.0 | 0.0 | 3.5 | 3.5 | 4.5 | 7.0 | 10.0 | 16.0 | 22.0 | 21.0 | 12.0 |
| 19 | 8.0 | 4.5 | 0.0 | 1.0 | 4.0 | 5.5 | 9.5 | 10.0 | 17.0 | 22.0 | 21.5 | 12.5 |
| 20 | 8.0 | 3.5 | 0.0 | 1.0 | 3.0 | 7.0 | 8.0 | 10.0 | 18.0 | 21.0 | 21.0 | 9.5 |
| 21 | 8.0 | 2.0 | 0.5 | 1.0 | 3.5 | 3.5 | 8.0 | 9.0 | 19.5 | 20.0 | 22.0 | 12.5 |
| 22 | 7.5 | 0.0 | 0.5 | 1.0 | 3.5 | 2.5 | 9.5 | 8.0 | 20.0 | 22.0 | 18.0 | 13.0 |
| 23 | 7.0 | 1.5 | 0.5 | 0.5 | 4.5 | 5.0 | 11.5 | 9.0 | 20.0 | 22.0 | 19.5 | 14.5 |
| 24 | 7.0 | 5.0 | 0.0 | 3.0 | 3.5 | 8.0 | 9.0 | 15.0 | 20.0 | 23.5 | 20.5 | 14.0 |
| 25 | 4.5 | 3.0 | 0.5 | 3.0 | 2.0 | 6.5 | 7.0 | 15.5 | 17.0 | 20.0 | 20.0 | --- |
| 26 | 5.5 | 2.5 | 0.5 | 2.5 | 2.0 | 6.0 | 6.0 | 16.0 | 14.5 | 21.5 | 19.0 | 12.0 |
| 27 | 5.0 | 2.0 | 0.0 | 2.5 | 0.5 | 6.0 | 6.0 | 16.5 | 13.0 | 20.5 | 23.0 | 11.0 |
| 28 | 5.0 | 2.5 | 0.0 | 3.0 | 1.0 | 7.0 | 8.5 | 17.0 | 11.0 | 18.0 | 22.5 | 11.0 |
| 29 | 6.0 | 3.0 | 1.0 | 4.5 | --- | 6.5 | 12.0 | 14.0 | 15.0 | 20.0 | 18.0 | 9.0 |
| 30 | 6.5 | 4.0 | 1.0 | 7.0 | --- | 10.0 | 12.0 | 13.0 | 17.0 | 21.0 | 17.5 | 8.5 |
| 31 | 5.0 | --- | 1.0 | 6.0 | --- | 7.0 | --- | 12.0 | --- | 20.0 | 19.0 | --- |
| MONTH | 8.5 | 4.0 | 1.0 | 2.0 | 3.0 | 4.5 | 8.0 | 12.5 | 15.5 | 19.5 | 21.5 | 14.0 |
| YEAR | 9.5 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|
| APR. 25... | 1545 | 7.0 | 4840 | 319 | 4170 | 61 | 77 | 97 | 100 |

06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1550 | 21 | 88 | 1660 | 26 | 117 | 1830 | 14 | 69 |
| 2 | 1540 | 17 | 71 | 1700 | 21 | 96 | 1700 | 13 | 60 |
| 3 | 1530 | 18 | 74 | 1700 | 21 | 96 | 1600 | 23 | 99 |
| 4 | 1450 | 21 | 82 | 1660 | 12 | 54 | 1600 | 35 | 151 |
| 5 | 1460 | 29 | 114 | 1670 | 4 | 18 | 1600 | 18 | 78 |
| 6 | 1470 | 21 | 83 | 1720 | 10 | 46 | 1590 | 16 | 69 |
| 7 | 1490 | 24 | 97 | 1780 | 12 | 58 | 1610 | 15 | 65 |
| 8 | 1520 | 12 | 49 | 1780 | 9 | 43 | 1670 | 29 | 131 |
| 9 | 1590 | 12 | 52 | 1770 | 8 | 38 | 1680 | 16 | 73 |
| 10 | 1640 | 24 | 106 | 1810 | 10 | 49 | 1620 | 12 | 52 |
| 11 | 1680 | 23 | 104 | 1780 | 7 | 34 | 1580 | 22 | 94 |
| 12 | 1700 | 19 | 87 | 1740 | 8 | 38 | 1550 | 28 | 117 |
| 13 | 1780 | 20 | 96 | 1730 | 8 | 37 | 1540 | 11 | 46 |
| 14 | 1790 | 14 | 68 | 1720 | 9 | 42 | 1450 | 13 | 51 |
| 15 | 1790 | 10 | 48 | 1650 | 8 | 36 | 1440 | 26 | 101 |
| 16 | 1820 | 11 | 54 | 1610 | 12 | 52 | 1490 | 22 | 89 |
| 17 | 1780 | 8 | 38 | 1640 | 9 | 40 | 1450 | 16 | 63 |
| 18 | 1730 | 10 | 47 | 1710 | 10 | 46 | 1410 | 16 | 61 |
| 19 | 1620 | 16 | 70 | 1710 | 6 | 28 | 1360 | 66 | 242 |
| 20 | 1620 | 13 | 57 | 1650 | 5 | 22 | 1350 | 91 | 332 |
| 21 | 1600 | 10 | 43 | 1620 | 10 | 44 | 1350 | 65 | 237 |
| 22 | 1600 | 8 | 35 | 1540 | 20 | 83 | 1350 | 30 | 109 |
| 23 | 1600 | 21 | 91 | 1470 | 37 | 147 | 1300 | 36 | 126 |
| 24 | 1680 | 16 | 73 | 1510 | 30 | 122 | 1300 | 40 | 140 |
| 25 | 1720 | 16 | 74 | 1900 | 20 | 103 | 1350 | 38 | 139 |
| 26 | 1700 | 16 | 73 | 2040 | 20 | 110 | 1450 | 19 | 74 |
| 27 | 1670 | 12 | 54 | 1860 | 17 | 85 | 1480 | 36 | 144 |
| 28 | 1580 | 23 | 98 | 1850 | 15 | 75 | 1500 | 63 | 255 |
| 29 | 1540 | 26 | 108 | 1780 | 12 | 58 | 1500 | 55 | 223 |
| 30 | 1520 | 25 | 103 | 1830 | 12 | 59 | 1480 | 59 | 236 |
| 31 | 1550 | 16 | 67 | -- | -- | -- | 1450 | 22 | 86 |
| TOTAL | 50310 | -- | 2304 | 51590 | -- | 1876 | 46630 | -- | 3812 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1350 | 16 | 58 | 2050 | 74 | 410 | 1360 | 47 | 173 |
| 2 | 1300 | 18 | 63 | 2360 | 103 | 656 | 1400 | 44 | 166 |
| 3 | 1250 | 30 | 101 | 2120 | 65 | 372 | 1330 | 57 | 205 |
| 4 | 1200 | 18 | 58 | 1790 | 47 | 227 | 1350 | 28 | 102 |
| 5 | 1150 | 17 | 53 | 1760 | 87 | 413 | 1330 | 30 | 108 |
| 6 | 1200 | 21 | 68 | 1740 | 65 | 305 | 1280 | 46 | 159 |
| 7 | 1300 | 15 | 53 | 1730 | 99 | 462 | 1320 | 45 | 160 |
| 8 | 1350 | 10 | 36 | 1730 | 113 | 528 | 1350 | 44 | 160 |
| 9 | 1400 | 26 | 98 | 1650 | 106 | 472 | 1350 | 32 | 117 |
| 10 | 1400 | 21 | 79 | 1650 | 50 | 223 | 1350 | 35 | 128 |
| 11 | 1400 | 7 | 26 | 1720 | 89 | 413 | 1240 | 30 | 100 |
| 12 | 1400 | 58 | 219 | 1740 | 52 | 244 | 1250 | 27 | 91 |
| 13 | 1250 | 139 | 469 | 1760 | 56 | 266 | 1380 | 44 | 164 |
| 14 | 1100 | 45 | 134 | 1760 | 46 | 219 | 1360 | 37 | 136 |
| 15 | 1200 | 40 | 130 | 1780 | 42 | 202 | 1360 | 33 | 121 |
| 16 | 1300 | 52 | 183 | 1740 | 31 | 146 | 1340 | 26 | 94 |
| 17 | 1400 | 44 | 166 | 1700 | 36 | 165 | 1330 | 30 | 108 |
| 18 | 1450 | 69 | 270 | 1680 | 35 | 159 | 1280 | 29 | 100 |
| 19 | 1450 | 114 | 446 | 1650 | 31 | 138 | 1180 | 26 | 83 |
| 20 | 1460 | 81 | 319 | 1550 | 31 | 130 | 1180 | 20 | 64 |
| 21 | 1320 | 70 | 249 | 1500 | 36 | 146 | 1310 | 25 | 88 |
| 22 | 1390 | 28 | 105 | 1460 | 35 | 138 | 1300 | 36 | 126 |
| 23 | 1330 | 16 | 57 | 1510 | 34 | 139 | 1330 | 30 | 108 |
| 24 | 1340 | 47 | 170 | 1470 | 25 | 99 | 1330 | 26 | 93 |
| 25 | 1310 | 63 | 223 | 1460 | 30 | 118 | 1350 | 28 | 102 |
| 26 | 1330 | 96 | 345 | 1390 | 30 | 113 | 1360 | 15 | 55 |
| 27 | 1350 | 125 | 456 | 1440 | 41 | 159 | 1430 | 31 | 120 |
| 28 | 1360 | 73 | 268 | 1430 | 54 | 208 | 1490 | 46 | 185 |
| 29 | 1360 | 49 | 180 | -- | -- | -- | 1520 | 46 | 189 |
| 30 | 1490 | 57 | 229 | -- | -- | -- | 1510 | 43 | 175 |
| 31 | 1740 | 78 | 366 | -- | -- | -- | 1620 | 70 | 306 |
| TOTAL | 41630 | -- | 5677 | 47320 | -- | 7270 | 41870 | -- | 4086 |

06026500 JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1900 | 84 | 431 | 3690 | 86 | 857 | 9690 | 95 | 2490 |
| 2 | 1900 | 88 | 451 | 4020 | 88 | 955 | 9890 | 197 | 5260 |
| 3 | 1850 | 75 | 375 | 4360 | 89 | 1050 | 9610 | 167 | 4330 |
| 4 | 1790 | 70 | 338 | 4870 | 133 | 1750 | 8600 | 114 | 2650 |
| 5 | 1810 | 47 | 230 | 5670 | 218 | 3340 | 8110 | 137 | 3000 |
| 6 | 1850 | 47 | 235 | 6160 | 249 | 4140 | 7630 | 115 | 2370 |
| 7 | 1990 | 79 | 424 | 6650 | 237 | 4260 | 7280 | 102 | 2000 |
| 8 | 2210 | 93 | 555 | 6980 | 414 | 7800 | 6900 | 98 | 1830 |
| 9 | 2270 | 95 | 582 | 7280 | 223 | 4380 | 7300 | 120 | 2370 |
| 10 | 2350 | 62 | 393 | 7500 | 156 | 3160 | 7750 | 238 | 4980 |
| 11 | 2570 | 58 | 402 | 7600 | 104 | 2130 | 8420 | 207 | 4710 |
| 12 | 2330 | 57 | 359 | 7530 | 119 | 2420 | 8710 | 156 | 3670 |
| 13 | 2150 | 50 | 290 | 7780 | 226 | 4750 | 8730 | 132 | 3110 |
| 14 | 1980 | 46 | 246 | 8650 | 245 | 5720 | 9100 | 140 | 3440 |
| 15 | 2040 | 58 | 319 | 8990 | 210 | 5100 | 8810 | 122 | 2900 |
| 16 | 2680 | 124 | 897 | 9070 | 234 | 5730 | 8320 | 92 | 2070 |
| 17 | 2700 | 81 | 590 | 9100 | 171 | 4200 | 7800 | 71 | 1500 |
| 18 | 2540 | 57 | 391 | 8340 | 147 | 3310 | 7230 | 59 | 1150 |
| 19 | 2300 | 49 | 304 | 7750 | 110 | 2300 | 6700 | 76 | 1370 |
| 20 | 2290 | 47 | 291 | 6750 | 120 | 2190 | 6300 | 84 | 1430 |
| 21 | 2750 | 84 | 624 | 5870 | 84 | 1330 | 6090 | 75 | 1230 |
| 22 | 2990 | 129 | 1040 | 5320 | 97 | 1390 | 6060 | 77 | 1260 |
| 23 | 3390 | 173 | 1580 | 4810 | 78 | 1010 | 6280 | 59 | 1000 |
| 24 | 3820 | 390 | 4020 | 4400 | 53 | 630 | 6450 | 50 | 871 |
| 25 | 4420 | 393 | 4690 | 4140 | 47 | 525 | 6090 | 52 | 855 |
| 26 | 4460 | 131 | 1580 | 4200 | 40 | 454 | 6090 | 60 | 987 |
| 27 | 3780 | 115 | 1170 | 4500 | 41 | 498 | 7030 | 88 | 1670 |
| 28 | 3280 | 66 | 584 | 5210 | 76 | 1070 | 7600 | 125 | 2570 |
| 29 | 3080 | 52 | 432 | 6600 | 130 | 2320 | 8320 | 88 | 1980 |
| 30 | 3310 | 63 | 563 | 7950 | 148 | 3180 | 8080 | 75 | 1640 |
| 31 | -- | -- | -- | 9020 | 176 | 4290 | -- | -- | -- |
| TOTAL | 78780 | -- | 24386 | 200760 | -- | 86239 | 230970 | -- | 70693 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 6780 | 55 | 1010 | 1320 | 14 | 50 | 1520 | 81 | 332 |
| 2 | 5650 | 61 | 931 | 1270 | 15 | 51 | 1490 | 57 | 229 |
| 3 | 5210 | 53 | 746 | 1210 | 21 | 69 | 1550 | 53 | 222 |
| 4 | 4960 | 40 | 536 | 1240 | 21 | 70 | 1610 | 37 | 161 |
| 5 | 4810 | 47 | 610 | 1280 | 21 | 73 | 1650 | 34 | 151 |
| 6 | 4460 | 44 | 530 | 1270 | 21 | 72 | 1650 | 31 | 138 |
| 7 | 4140 | 33 | 369 | 1290 | 21 | 73 | 1730 | 31 | 145 |
| 8 | 3850 | 28 | 291 | 1330 | 26 | 93 | 1740 | 34 | 160 |
| 9 | 3580 | 40 | 387 | 1280 | 24 | 83 | 1730 | 35 | 163 |
| 10 | 3370 | 42 | 382 | 1190 | 16 | 51 | 1720 | 31 | 144 |
| 11 | 3260 | 42 | 370 | 1130 | 18 | 55 | 1680 | 26 | 118 |
| 12 | 3120 | 33 | 278 | 1080 | 25 | 73 | 1640 | 19 | 84 |
| 13 | 3010 | 35 | 284 | 1030 | 14 | 39 | 1590 | 19 | 82 |
| 14 | 2770 | 34 | 254 | 900 | 19 | 46 | 1550 | 24 | 100 |
| 15 | 2470 | 20 | 133 | 870 | 15 | 35 | 1530 | 17 | 70 |
| 16 | 2320 | 17 | 106 | 900 | 16 | 39 | 1530 | 19 | 78 |
| 17 | 2320 | 23 | 144 | 870 | 20 | 47 | 1560 | 21 | 88 |
| 18 | 2300 | 25 | 155 | 920 | 27 | 67 | 1590 | 15 | 64 |
| 19 | 2170 | 23 | 135 | 1000 | 32 | 86 | 1590 | 13 | 56 |
| 20 | 2170 | 27 | 158 | 1050 | 40 | 113 | 1600 | 15 | 65 |
| 21 | 2140 | 26 | 150 | 1030 | 44 | 122 | 1620 | 14 | 61 |
| 22 | 2080 | 25 | 140 | 970 | 57 | 149 | 1660 | 13 | 58 |
| 23 | 2030 | 25 | 137 | 1010 | 45 | 123 | 1640 | 14 | 62 |
| 24 | 1980 | 23 | 123 | 1030 | 53 | 147 | 1620 | 10 | 44 |
| 25 | 1860 | 21 | 105 | 1050 | 55 | 156 | 1640 | 10 | 44 |
| 26 | 1730 | 17 | 79 | 1110 | 47 | 141 | 1720 | 14 | 65 |
| 27 | 1590 | 17 | 73 | 1100 | 46 | 137 | 1730 | 16 | 75 |
| 28 | 1490 | 16 | 64 | 1070 | 47 | 136 | 1700 | 13 | 60 |
| 29 | 1500 | 27 | 109 | 1060 | 79 | 226 | 1740 | 12 | 56 |
| 30 | 1460 | 20 | 79 | 1310 | 85 | 301 | 1790 | 9 | 43 |
| 31 | 1390 | 11 | 41 | 1520 | 80 | 328 | -- | -- | -- |
| TOTAL | 91970 | -- | 8909 | 34690 | -- | 3251 | 49110 | -- | 3218 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 965630
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 221721

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MONT.

LOCATION.--Lat 46°38'58", long 111°43'39", in NW¼SE¼SE¼ sec.4, T.10 N., R.1 W., Lewis and Clark County, just downstream from generator outlet at Canyon Ferry Dam, 15 miles east of Helena, and at mile 2,242.8.

DRAINAGE AREA.--15,904 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1971.
Water temperatures: October 1967 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 245 mg/l Mar. 1-31; minimum, 172 mg/l July 8-31.
Hardness: Maximum, 160 mg/l Mar. 1-31, Apr. 1-30; minimum, 100 mg/l Aug. 1-31.
Specific conductance: Maximum daily, 408 micromhos May 2; minimum daily, 253 micromhos Aug. 19-21.
Water temperatures: Maximum, 17.5°C Sept. 7, 8, 9; minimum, freezing point on many days during December to February.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DISCHARGE (CFS) | TEMPERATURE (DEG C) | DISSOLVED SILICA (SIO2) (MG/L) | DISSOLVED IRON (FE) (UG/L) | DISSOLVED CALCIUM (CA) (MG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED SODIUM (NA) (MG/L) | DISSOLVED POTASSIUM (K) (MG/L) | BICARBONATE (HCO3) (MG/L) | CARBONATE (CO3) (MG/L) | DISSOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 4690 | -- | 20 | -- | 36 | 10 | 17 | 4.0 | 156 | 0 | 33 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 5360 | -- | 19 | -- | 37 | 12 | 17 | 4.3 | 161 | 0 | 34 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 5540 | -- | 19 | -- | 38 | 11 | 18 | 4.4 | 162 | 0 | 35 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 5890 | -- | 21 | 20 | 39 | 12 | 19 | 5.8 | 173 | 0 | 25 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 5990 | -- | 22 | 10 | 40 | 11 | 20 | 4.0 | 178 | -- | 41 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 6190 | -- | 24 | 20 | 42 | 13 | 21 | 4.8 | 176 | -- | 41 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 8890 | -- | 23 | 30 | 41 | 13 | 21 | 3.8 | 182 | 0 | 42 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 12600 | -- | 22 | 10 | 39 | 12 | 21 | 3.8 | 173 | 0 | 36 |
| JUNE | | | | | | | | | | | | |
| 01-15 | -- | 8440 | -- | 21 | 80 | 35 | 10 | 20 | 3.5 | 165 | 0 | 36 |
| 16-30 | -- | 8250 | -- | 21 | 10 | 31 | 9.0 | 17 | 3.3 | 143 | 0 | 30 |
| JULY | | | | | | | | | | | | |
| 01-07 | -- | 15000 | -- | 21 | 10 | 31 | 8.9 | 16 | 3.1 | 142 | 0 | 30 |
| 08-31 | -- | 7300 | -- | 20 | 10 | 29 | 8.1 | 13 | 2.9 | 135 | 0 | 25 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 4990 | -- | 19 | 10 | 28 | 7.8 | 13 | 2.5 | 137 | 0 | 33 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 4860 | -- | 19 | 0 | 31 | 8.6 | 13 | 2.1 | 135 | 0 | 33 |
| WTD. AVG. | -- | -- | -- | 21 | -- | 36 | 11 | 18 | 3.8 | 162 | 0 | 35 |
| TIME WTD. AVG. | -- | 6870 | -- | 21 | -- | 36 | 11 | 18 | 3.8 | 160 | 0 | 34 |
| TONS PER DAY | -- | -- | -- | 390 | -- | 675 | 201 | 336 | 71 | 3000 | 0 | 640 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 16... | 1625 | 3580 | 12.5 | 20 | 10 | 38 | 10 | 17 | 3.6 | 152 | 0 | 35 |
| JAN., 1971 | | | | | | | | | | | | |
| 19... | 1100 | 5970 | 3.0 | 20 | 110 | 39 | 11 | 17 | 3.8 | 168 | 0 | 35 |
| APR. | | | | | | | | | | | | |
| 20... | 1500 | 9000 | 5.0 | 24 | 20 | 44 | 13 | 22 | 5.5 | 176 | -- | 43 |
| JULY | | | | | | | | | | | | |
| 15... | 1415 | 8000 | 15.5 | 20 | 40 | 29 | 8.0 | 13 | 3.3 | 124 | 0 | 26 |

| DATE | TIME | DISCHARGE (CFS) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED MANGANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 16... | 1625 | 3580 | .020 | 60 | 29 |
| NOV. | | | | | |
| 23... | 1340 | 5370 | .030 | -- | -- |
| DEC. | | | | | |
| 18... | 1500 | 5710 | .010 | -- | -- |
| JAN., 1971 | | | | | |
| 19... | 1100 | 5970 | .040 | 150 | 100 |
| FEB. | | | | | |
| 18... | 1400 | 6080 | .040 | -- | -- |
| MAR. | | | | | |
| 16... | 1430 | 6240 | .070 | -- | -- |

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 282 mg/l Mar. 1-31, 1970; minimum, 172 mg/l July 8-31, 1971.
Hardness: Maximum, 164 mg/l Apr. 1-30, 1969; minimum, 100 mg/l Aug. 1-31, 1971.
Specific conductance: Maximum daily, 410 micromhos Apr. 25, 1969, Apr. 5, 1970; minimum daily, 241 micromhos Dec. 16, 1968.
Water temperatures: Maximum observed, 20.0°C Aug. 27, 1969; minimum, freezing point on several days during winter period most years.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Dissolved solids, 252 mg/l Apr. 20; minimum, 170 mg/l July 15. Records of discharge furnished by Canyon Ferry Project Office, Bureau of Reclamation, Helena, Mont.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 7.9 | .7 | -- | -- | 206 | .28 | 2630 | 130 | 4 | .6 | 328 | 8.0 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 8.6 | .9 | -- | -- | 212 | .30 | 3240 | 140 | 7 | .6 | 344 | 7.9 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 7.8 | .8 | -- | -- | 214 | .29 | 3160 | 140 | 6 | .7 | 343 | 7.9 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 9.0 | 1.1 | .10 | .05 | 220 | .30 | 3500 | 150 | 8 | .7 | 358 | 8.3 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 9.1 | 1.0 | .10 | .06 | 236 | .32 | 3820 | 150 | 0 | .7 | 367 | 8.0 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 11 | .9 | .10 | .03 | 245 | .33 | 4090 | 160 | 14 | .7 | 403 | 8.1 |
| APR. | | | | | | | | | | | | |
| 01-30 | 9.1 | .8 | .01 | .09 | 243 | .33 | 5830 | 160 | 7 | .7 | 393 | 8.1 |
| MAY | | | | | | | | | | | | |
| 01-31 | 9.9 | 1.0 | .01 | .06 | 230 | .31 | 7830 | 150 | 5 | .8 | 378 | 7.9 |
| JUNE | | | | | | | | | | | | |
| 01-15 | 9.4 | 1.0 | .00 | .09 | 217 | .30 | 4950 | 130 | 0 | .8 | 333 | 8.0 |
| 16-30 | 7.6 | 1.0 | .00 | .06 | 190 | .26 | 4230 | 110 | 0 | .7 | 298 | 7.9 |
| JULY | | | | | | | | | | | | |
| 01-07 | 8.4 | 1.0 | .00 | .03 | 189 | .26 | 7650 | 110 | 0 | .7 | 297 | 8.1 |
| 08-31 | 6.6 | 1.1 | .05 | .03 | 172 | .23 | 3390 | 110 | 0 | .6 | 269 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 4.0 | .5 | .00 | .03 | 175 | .24 | 2360 | 100 | 0 | .6 | 264 | 7.8 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 6.6 | .8 | .01 | .06 | 181 | .25 | 2380 | 110 | 2 | .5 | 283 | 7.9 |
| WTD. AVG. | 8.4 | .9 | -- | -- | 214 | .29 | -- | 136 | 4 | .7 | 342 | 8.0 |
| TIME WTD. AVG. | 8.2 | .9 | -- | -- | 212 | .29 | -- | 135 | 4 | .7 | 337 | 8.0 |
| TONS PER DAY | 157 | 17 | -- | -- | 3970 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| OCT. | | | | | | | | | | | | |
| 16... | 8.4 | .8 | -- | -- | 208 | .29 | 2040 | 140 | 13 | .6 | 337 | 7.9 |
| JAN., 1971 | | | | | | | | | | | | |
| 19... | 8.0 | 1.1 | .00 | .10 | 220 | .30 | 3550 | 140 | 2 | .6 | 326 | 8.2 |
| APR. | | | | | | | | | | | | |
| 20... | 11 | .9 | .30 | .21 | 252 | .34 | 6120 | 160 | 19 | .8 | 400 | 8.1 |
| JULY | | | | | | | | | | | | |
| 15... | 6.7 | .7 | .40 | .15 | 170 | .23 | 3670 | 110 | 4 | .6 | 260 | 8.0 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| APR. | | | | | |
| 20... | 1500 | 9000 | .20 | 120 | 20 |
| MAY | | | | | |
| 18... | 1500 | 14000 | .050 | -- | -- |
| JUNE | | | | | |
| 22... | 1000 | 6030 | .090 | -- | -- |
| JULY | | | | | |
| 15... | 1415 | 8000 | .080 | 130 | 0 |
| AUG. | | | | | |
| 20... | 1400 | 4150 | .030 | -- | -- |
| SEP. | | | | | |
| 21... | 1400 | 5540 | .090 | -- | -- |

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 345 | 329 | 350 | 347 | 377 | 388 | 400 | 390 | 361 | 291 | 258 | 265 |
| 2 | 337 | 328 | 346 | 348 | 380 | 386 | 392 | 408 | 356 | 310 | 258 | 265 |
| 3 | 338 | 325 | 336 | 349 | 381 | 385 | 392 | 394 | 351 | 308 | 258 | 265 |
| 4 | 338 | 332 | 340 | 351 | 383 | 390 | 391 | 390 | 349 | 297 | 258 | 268 |
| 5 | 341 | 332 | 339 | 349 | 385 | 391 | 392 | 390 | 349 | 293 | 258 | 268 |
| 6 | 342 | 335 | 342 | 351 | 385 | 391 | 395 | 390 | 353 | 300 | 258 | 268 |
| 7 | 342 | 336 | 347 | 355 | 386 | 391 | 394 | 390 | 350 | 285 | 258 | 268 |
| 8 | 330 | 339 | 346 | 354 | 392 | 402 | 389 | 390 | 338 | 266 | 258 | 268 |
| 9 | 327 | 336 | 339 | 353 | 380 | 395 | 385 | 390 | 338 | 276 | 264 | 268 |
| 10 | 327 | 339 | 339 | 354 | 378 | 396 | 389 | 383 | 338 | 276 | 264 | 265 |
| 11 | 328 | 336 | 339 | 348 | 382 | 402 | 394 | 385 | 336 | 279 | 258 | 278 |
| 12 | 332 | 336 | 343 | 353 | 380 | 401 | 397 | 384 | 338 | 274 | 258 | 270 |
| 13 | 333 | 343 | 347 | 358 | 385 | 396 | 401 | 390 | 331 | 266 | 258 | 283 |
| 14 | 329 | 339 | 343 | 358 | 380 | 396 | 400 | 343 | 334 | 274 | 258 | 268 |
| 15 | 326 | 339 | 342 | 357 | 376 | 395 | 399 | 385 | 329 | 279 | 255 | 268 |
| 16 | 325 | 336 | 343 | 362 | 380 | 390 | 394 | 380 | 323 | 279 | 271 | 268 |
| 17 | 324 | 340 | 344 | 358 | 380 | 391 | 394 | 383 | 327 | 276 | 258 | 265 |
| 18 | 329 | 340 | 345 | 362 | 380 | 390 | 396 | 378 | 328 | 276 | 264 | 268 |
| 19 | 334 | 344 | 347 | 366 | 391 | 391 | 397 | 378 | 327 | 276 | 253 | 278 |
| 20 | 328 | 342 | 348 | 370 | 387 | 390 | 395 | 372 | 320 | 274 | 253 | 278 |
| 21 | 326 | 344 | 345 | 366 | 386 | 391 | 399 | 371 | 317 | 279 | 253 | 283 |
| 22 | 326 | 340 | 348 | 372 | 390 | 391 | 397 | 369 | 312 | 279 | 255 | 289 |
| 23 | 326 | 344 | 353 | 371 | 386 | 390 | 395 | 371 | 313 | 279 | 258 | 292 |
| 24 | 330 | 342 | 353 | 371 | 385 | 390 | 397 | 369 | 313 | 279 | 255 | 317 |
| 25 | 342 | 354 | 353 | 377 | 380 | 386 | 397 | 367 | 307 | 274 | 271 | 320 |
| 26 | 333 | 340 | 353 | 376 | 386 | 396 | 399 | 385 | 304 | 266 | 258 | 308 |
| 27 | 334 | 347 | 350 | 376 | 390 | 395 | 405 | 380 | 298 | 276 | 258 | 304 |
| 28 | 330 | 343 | 353 | 377 | 390 | 395 | 401 | 384 | 298 | 276 | 255 | 305 |
| 29 | 330 | 342 | 352 | 376 | --- | 395 | 405 | 381 | 281 | 274 | 255 | 301 |
| 30 | 333 | 340 | 353 | 377 | --- | 391 | 403 | 376 | 301 | 274 | 255 | 308 |
| 31 | 334 | --- | 353 | 377 | --- | 391 | --- | 373 | --- | 266 | 255 | --- |
| MONTH | 332 | 339 | 346 | 362 | 384 | 393 | 396 | 381 | 327 | 280 | 258 | 281 |
| YEAR | 340 | | | | | | | | | | | |

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14.0 | 9.5 | 5.0 | 0.5 | 1.5 | 2.5 | 4.0 | 5.5 | 11.0 | 13.5 | 15.5 | 16.0 |
| 2 | 14.0 | 9.5 | 5.5 | 0.0 | 2.0 | 2.5 | 4.0 | 5.5 | 11.5 | 13.5 | 15.5 | 16.0 |
| 3 | 14.0 | 9.0 | 5.0 | 0.0 | 1.5 | 2.5 | 4.0 | 6.0 | 12.0 | 13.0 | 16.0 | 16.0 |
| 4 | 14.0 | 9.0 | 5.0 | 0.0 | 1.5 | 2.5 | 4.0 | 6.5 | 12.0 | 13.5 | 16.0 | 16.5 |
| 5 | 13.5 | 9.5 | 5.0 | 0.0 | 1.5 | 2.5 | 4.0 | 6.5 | 12.0 | 14.0 | 16.0 | 17.0 |
| 6 | 11.5 | 9.5 | 5.5 | 0.0 | 1.0 | 2.5 | 4.0 | 6.0 | 12.0 | 13.5 | 16.0 | 17.0 |
| 7 | 11.5 | 9.5 | 5.5 | 0.0 | 0.0 | 2.5 | 4.0 | 6.0 | 12.0 | 14.0 | 16.0 | 17.5 |
| 8 | 11.5 | 9.5 | 5.0 | 0.0 | 0.0 | 2.5 | 4.0 | 6.5 | 12.0 | 15.0 | 16.0 | 17.5 |
| 9 | 12.0 | 9.0 | 3.5 | 0.0 | 2.0 | 3.0 | 4.0 | 7.0 | 12.0 | 15.0 | 16.0 | 17.5 |
| 10 | 12.0 | 8.0 | 2.5 | 0.0 | 2.5 | 3.0 | 4.0 | 7.0 | 11.5 | 15.0 | 16.0 | 17.0 |
| 11 | 12.5 | 8.0 | 3.5 | 0.0 | 2.5 | 3.0 | 4.0 | 7.0 | 12.0 | 15.0 | 16.0 | 17.0 |
| 12 | 11.5 | 8.0 | 3.5 | 0.0 | 2.5 | 3.0 | 4.0 | 7.0 | 12.0 | 15.0 | 16.0 | 17.0 |
| 13 | 11.0 | 8.0 | 3.5 | 0.0 | 3.0 | 3.0 | 4.0 | 7.0 | 12.5 | 15.0 | 16.0 | 16.5 |
| 14 | 11.5 | 7.5 | 3.5 | 0.0 | 3.0 | 3.0 | 4.5 | 8.0 | 11.5 | 15.0 | 16.0 | 16.5 |
| 15 | 12.0 | 8.0 | 3.0 | 2.0 | 3.0 | 3.5 | 4.5 | 8.0 | 12.0 | 15.0 | 16.5 | 16.5 |
| 16 | 12.0 | 8.0 | 3.0 | 2.0 | 3.0 | 3.5 | 4.5 | 8.5 | 12.0 | 15.0 | 16.0 | 17.0 |
| 17 | 12.0 | 8.0 | 1.5 | 2.5 | 3.0 | 3.5 | 4.5 | 8.5 | 12.0 | 15.0 | 16.0 | 17.0 |
| 18 | 12.0 | 7.0 | 0.0 | 3.0 | 2.5 | 3.0 | 4.5 | 9.0 | 12.0 | 15.0 | 16.0 | 17.0 |
| 19 | 12.0 | 7.0 | 0.0 | 2.5 | 2.5 | 3.0 | 4.5 | 10.0 | 12.5 | 15.0 | 16.0 | 17.0 |
| 20 | 12.5 | 7.0 | 0.0 | 2.0 | 2.5 | 3.0 | 5.0 | 10.0 | 12.5 | 15.0 | 16.0 | 16.5 |
| 21 | 11.5 | 5.5 | 0.0 | 2.0 | 2.5 | 3.0 | 5.0 | 10.0 | 12.5 | 15.0 | 16.0 | 16.5 |
| 22 | 11.0 | 5.5 | 0.5 | 1.0 | 2.5 | 3.0 | 5.0 | 10.0 | 13.0 | 15.0 | 16.0 | 16.0 |
| 23 | 11.0 | 5.0 | 0.0 | 2.0 | 2.5 | 3.0 | 5.5 | 10.0 | 13.0 | 15.0 | 16.0 | 16.0 |
| 24 | 10.5 | 6.0 | 0.0 | 2.0 | 2.5 | 3.0 | 5.5 | 10.5 | 13.0 | 15.0 | 16.0 | 15.0 |
| 25 | 10.0 | 5.5 | 0.0 | 2.0 | 2.5 | 3.0 | 5.5 | 11.0 | 13.5 | 15.0 | 16.0 | 16.0 |
| 26 | 10.5 | 5.0 | 0.0 | 4.0 | 2.5 | 3.0 | 5.5 | 11.0 | 13.0 | 15.5 | 16.5 | 15.0 |
| 27 | 10.0 | 2.0 | 0.0 | 3.5 | 2.5 | 3.0 | 5.0 | 11.0 | 14.5 | 15.0 | 16.5 | 15.0 |
| 28 | 9.5 | 2.0 | 0.0 | 3.5 | 2.5 | 3.0 | 5.0 | 11.0 | 14.5 | 15.0 | 16.5 | 15.0 |
| 29 | 9.5 | 6.0 | 2.0 | 3.5 | --- | 3.5 | 5.5 | 11.0 | 14.0 | 15.0 | 16.0 | 15.0 |
| 30 | 9.5 | 5.5 | 2.0 | 2.5 | --- | 3.5 | 5.5 | 10.5 | 13.5 | 15.0 | 16.0 | 15.0 |
| 31 | 9.5 | --- | 1.5 | 2.0 | --- | 4.0 | --- | 10.0 | --- | 15.0 | 16.5 | --- |
| MONTH | 11.5 | 7.0 | 2.5 | 1.5 | 2.0 | 3.0 | 4.5 | 8.5 | 12.5 | 14.5 | 16.0 | 16.5 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06080900 SUN RIVER BELOW DIVERSION DAM, NEAR AUGUSTA, MONT.

LOCATION.--Lat 47°37'10", long 112°41'28", near center of east line of sec.36, T.22 N., R.9 W., Lewis and Clark County, Lewis and Clark National Forest, at gaging station 1 mile downsteam from diversion dam, 16.5 miles northwest of Augusta, and at mile 95.6.

DRAINAGE AREA.--609 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1971.
Water temperatures: October 1967 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 240 mg/l Jan. 1-31; minimum, 104 mg/l June 1-30.
Hardness: Maximum, 210 mg/l Dec. 1-31, Jan. 1-31; minimum, 99 mg/l June 1-30.
Specific conductance: Maximum daily, 483 micromhos Jan. 29; minimum daily, 177 micromhos June 26.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-14 | -- | 62 | -- | 5.3 | -- | 49 | 13 | 2.2 | 1.1 | 173 | 0 | 38 |
| 15-31 | -- | 145 | -- | 5.8 | -- | 54 | 14 | 2.1 | 1.1 | 183 | 0 | 53 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 153 | -- | 7.1 | -- | 55 | 15 | 2.2 | 1.2 | 180 | 0 | 57 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 154 | -- | 5.1 | -- | 58 | 16 | 2.5 | 1.0 | 178 | 0 | 68 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 160 | -- | 6.0 | 60 | 56 | 17 | 2.3 | 1.1 | 193 | 0 | 64 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 173 | -- | 5.6 | 10 | 57 | 14 | 2.4 | 1.2 | 188 | -- | 65 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 175 | -- | 5.8 | 10 | 52 | 15 | 2.7 | 1.2 | 171 | 1 | 63 |
| APR. | | | | | | | | | | | | |
| 01-15 | -- | 165 | -- | 5.6 | 20 | 55 | 15 | 2.2 | .8 | 180 | 0 | 61 |
| 16-30 | -- | 666 | -- | 5.2 | 20 | 41 | 11 | 2.0 | .7 | 161 | 0 | 28 |
| MAY | | | | | | | | | | | | |
| 01-11 | -- | 1590 | -- | 5.8 | 10 | 38 | 10 | 2.2 | .8 | 155 | 0 | 19 |
| 12-31 | -- | 3560 | -- | 5.5 | 20 | 32 | 7.8 | 1.5 | .8 | 132 | 0 | 9.3 |
| JUNE | | | | | | | | | | | | |
| 01-30 | -- | 2540 | -- | 4.9 | 10 | 29 | 6.5 | 1.1 | .4 | 112 | 0 | 6.0 |
| JULY | | | | | | | | | | | | |
| 01-17 | -- | 261 | -- | 4.4 | 0 | 29 | 6.8 | 1.1 | .6 | 124 | 0 | 7.0 |
| 18-31 | -- | 102 | -- | 4.5 | 0 | 31 | 7.6 | 1.2 | .7 | 131 | 0 | 11 |
| AUG. | | | | | | | | | | | | |
| 19-31 | -- | 108 | -- | 4.8 | 20 | 39 | 9.7 | 1.5 | .4 | 148 | 0 | 28 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 125 | -- | 4.8 | 0 | 44 | 11 | 1.6 | .9 | 159 | 0 | 42 |
| WTD. AVG. | -- | -- | -- | 5.3 | -- | 35 | 8.8 | 1.6 | .7 | 136 | 0 | 18 |
| TIME WTD. AVG. | -- | 623 | -- | 5.5 | -- | 46 | 12 | 2.0 | .9 | 163 | 0 | 43 |
| TONS PER DAY | -- | -- | -- | 8.9 | -- | 59 | 15 | 2.6 | 1.2 | 228 | 0 | 30 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN. | | | | | | | | | | | | |
| 08... | 1230 | 152 | 2.0 | 5.4 | 160 | 52 | 17 | 2.1 | .9 | 184 | 0 | 58 |
| APR. | | | | | | | | | | | | |
| 01... | 1100 | 183 | 3.0 | 5.4 | 20 | 56 | 14 | 2.2 | 1.1 | 183 | -- | 56 |
| JULY | | | | | | | | | | | | |
| 08... | 1230 | 251 | 10.5 | 4.4 | 10 | 28 | 6.7 | 1.1 | .3 | 119 | 0 | 8.0 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 08... | 1045 | 50 | .010 | -- | -- |
| 29... | 1145 | 148 | .010 | -- | -- |
| DEC. | | | | | |
| 01... | 1330 | 158 | .000 | -- | -- |
| JAN., 1971 | | | | | |
| 08... | 1230 | 152 | .000 | 50 | 0 |
| FEB. | | | | | |
| 01... | 1300 | 170 | .000 | -- | -- |
| MAR. | | | | | |
| 02... | 1200 | 211 | .050 | -- | -- |

06080900 SUN RIVER BELOW DIVERSION DAM, NEAR AUGUSTA, MONT.--Continued

EXTREMES, 1970-71.--Continued
Water temperatures: Maximum observed, 15.0°C Aug. 13, 24, 31; minimum, freezing point Jan. 12-14.

Period of record:
Dissolved solids: Maximum, 260 mg/l Feb. 11-29, 1968; minimum, 104 mg/l June 1-30, 1971.
Hardness: Maximum, 221 mg/l Jan. 1-31, 1970; minimum, 99 mg/l June 1-30, 1971.
Specific conductance: Maximum daily, 483 micromhos Jan. 29, 1971; minimum daily, 177 micromhos June 26, 1971.
Water temperatures: Maximum observed, 18.0°C Aug. 22, Sept. 2, 1970; minimum, freezing point on several days during winter period most years.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Minimum observed during water year: Hardness, 97 mg/l July 8.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-14 | .7 | .2 | -- | -- | 194 | .27 | 32.8 | 170 | 32 | .1 | 332 | 7.9 |
| 15-31 | .5 | .3 | -- | -- | 222 | .31 | 89.7 | 190 | 43 | .1 | 368 | 7.9 |
| NOV. | | | | | | | | | | | | |
| 01-30 | .8 | .6 | -- | -- | 227 | .34 | 103 | 200 | 50 | .1 | 386 | 7.4 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 1.0 | .1 | -- | -- | 239 | .32 | 98.1 | 210 | 63 | .1 | 400 | 8.0 |
| JAN. | | | | | | | | | | | | |
| 01-31 | .8 | .4 | .00 | .00 | 240 | .33 | 104 | 210 | 52 | .1 | 397 | 8.4 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 1.0 | .6 | .10 | .00 | 240 | .33 | 112 | 200 | 46 | .1 | 388 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 1.4 | .2 | .10 | .06 | 228 | .31 | 108 | 190 | 50 | .1 | 392 | 8.5 |
| APR. | | | | | | | | | | | | |
| 01-15 | 1.5 | .2 | .05 | .00 | 230 | .31 | 102 | 200 | 51 | .1 | 380 | 7.0 |
| 16-30 | .7 | .2 | .01 | .00 | 168 | .23 | 302 | 150 | 16 | .1 | 301 | 8.0 |
| MAY | | | | | | | | | | | | |
| 01-11 | .7 | .1 | .03 | .00 | 153 | .21 | 657 | 140 | 9 | .1 | 275 | 8.1 |
| 12-31 | .7 | .1 | .01 | .03 | 123 | .17 | 1180 | 110 | 4 | .1 | 198 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 01-30 | .8 | .1 | .00 | .00 | 104 | .14 | 713 | 99 | 7 | .0 | 192 | 7.7 |
| JULY | | | | | | | | | | | | |
| 01-17 | .9 | .6 | .02 | .00 | 111 | .15 | 78.2 | 100 | 0 | .0 | 197 | 7.9 |
| 18-31 | .7 | .7 | .00 | .00 | 122 | .17 | 33.6 | 110 | 1 | .1 | 210 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 19-31 | .1 | .0 | .00 | .03 | 156 | .21 | 45.5 | 140 | 16 | .1 | 265 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-30 | .7 | .2 | .02 | .03 | 184 | .25 | 62.1 | 160 | 25 | .1 | 298 | 8.1 |
| WTD. AVG. | .8 | .2 | -- | -- | 137 | .19 | -- | 124 | 13 | .1 | 236 | 7.9 |
| TIME WTD. AVG. | .9 | .3 | -- | -- | 191 | .26 | -- | 167 | 33 | .1 | 322 | 8.0 |
| TONS PER DAY | 1.3 | .3 | -- | -- | 231 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| JAN. | | | | | | | | | | | | |
| 08... | .8 | .3 | .00 | .00 | 230 | .31 | 94.4 | 200 | 49 | .1 | 361 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01... | .5 | .3 | .20 | .00 | 226 | .31 | 112 | 200 | 47 | .1 | 360 | 8.3 |
| JULY | | | | | | | | | | | | |
| 08... | .1 | .5 | .01 | .00 | 108 | .15 | 73.2 | 97 | 0 | .0 | 194 | 7.9 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| APR. | | | | | |
| 01... | 1100 | 183 | .020 | 20 | 0 |
| MAY | | | | | |
| 03... | 1815 | 1460 | .070 | -- | -- |
| 29... | 1725 | 6560 | .030 | -- | -- |
| JULY | | | | | |
| 08... | 1230 | 251 | .020 | 20 | 0 |
| 29... | 1900 | 80 | .010 | -- | -- |
| SEP. | | | | | |
| 10... | 1300 | 116 | .030 | -- | -- |

06080900 SUN RIVER BELOW DIVERSION DAM, NEAR AUGUSTA, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C) WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 320 | 371 | 398 | 411 | 399 | 395 | 375 | 284 | 187 | 192 | 217 | 290 |
| 2 | 317 | 363 | 398 | 397 | 405 | 399 | 377 | 287 | 192 | 194 | 217 | 290 |
| 3 | 321 | 374 | 396 | 402 | 401 | 399 | 381 | 287 | 192 | 194 | 217 | 290 |
| 4 | 321 | 374 | 400 | 401 | 404 | 396 | 385 | 287 | 196 | 199 | 221 | 290 |
| 5 | 318 | 377 | 398 | 401 | 406 | 397 | 393 | 287 | 192 | 199 | 217 | 296 |
| 6 | 317 | 378 | 404 | 407 | 372 | 397 | 391 | 282 | 192 | 194 | 228 | 290 |
| 7 | 324 | 386 | 440 | 407 | 406 | 399 | 379 | 284 | 192 | 194 | 221 | 290 |
| 8 | 325 | 386 | 432 | 397 | 408 | 401 | 386 | 266 | 187 | 194 | 221 | 290 |
| 9 | 339 | 385 | 361 | 386 | 410 | 396 | 379 | 252 | 187 | 194 | 221 | 285 |
| 10 | 336 | 382 | 400 | 388 | 406 | 424 | 379 | 246 | 186 | 199 | 221 | 290 |
| 11 | 339 | 373 | 399 | 400 | 430 | 414 | 385 | 244 | 187 | 199 | 223 | 296 |
| 12 | 339 | 388 | 405 | 411 | 423 | 397 | 380 | 232 | 189 | 204 | 224 | 293 |
| 13 | 343 | 383 | 401 | 411 | 417 | 385 | 385 | 227 | 192 | 204 | 224 | 293 |
| 14 | 343 | 387 | 393 | 397 | 401 | 395 | 381 | 223 | 185 | 207 | 224 | 293 |
| 15 | 361 | 391 | 394 | 394 | 417 | 396 | 380 | 223 | 186 | 204 | 224 | 285 |
| 16 | 363 | 392 | 383 | 389 | 410 | 391 | 316 | 220 | 186 | 205 | 233 | 293 |
| 17 | 364 | 391 | 389 | 392 | 401 | 381 | 320 | 220 | 192 | 205 | 233 | 296 |
| 18 | 370 | 378 | 388 | 411 | 396 | 383 | 318 | 223 | 187 | 210 | 243 | 299 |
| 19 | 362 | 395 | 394 | 408 | 398 | 187 | 313 | 215 | 186 | 210 | 251 | 299 |
| 20 | 369 | 385 | 393 | 402 | 397 | 354 | 313 | 215 | 187 | 205 | 245 | 296 |
| 21 | 376 | --- | 393 | 391 | 424 | 388 | 313 | 220 | 187 | 210 | 257 | 296 |
| 22 | 373 | --- | 399 | 395 | 417 | 376 | 314 | 220 | 187 | 210 | 257 | 296 |
| 23 | 369 | 373 | 398 | 396 | --- | 380 | 318 | 220 | 184 | 215 | 257 | 293 |
| 24 | 360 | 377 | 396 | 411 | --- | 391 | 317 | 220 | 184 | 215 | 262 | 299 |
| 25 | 379 | 378 | 399 | 415 | 416 | 404 | 317 | 220 | 186 | 215 | 264 | 299 |
| 26 | 362 | 392 | 371 | 412 | 402 | 376 | 323 | 210 | 177 | 215 | 264 | 299 |
| 27 | 374 | 395 | 399 | 413 | 400 | 424 | 313 | 209 | 184 | 215 | 264 | 317 |
| 28 | 379 | 397 | 404 | 413 | 396 | 390 | 291 | 209 | 187 | 215 | 264 | 322 |
| 29 | 369 | 393 | 404 | 483 | --- | 402 | 291 | 207 | 187 | 215 | 273 | 323 |
| 30 | 371 | 403 | 404 | 412 | --- | 381 | 291 | 207 | 186 | 215 | 264 | 335 |
| 31 | 372 | --- | 407 | 402 | --- | 386 | --- | 207 | --- | 215 | 285 | --- |
| MONTH | 351 | 384 | 398 | 405 | 406 | 387 | 347 | 237 | 188 | 205 | 240 | 297 |
| YEAR | 319 | | | | | | | | | | | |

06080900 SUN RIVER BELOW DIVERSION DAM, NEAR AUGUSTA, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.5 | 4.5 | 1.5 | 1.0 | 1.0 | 0.5 | --- | 4.0 | 7.0 | 7.5 | 11.5 | 12.5 |
| 2 | 8.0 | 3.5 | 1.5 | 0.5 | 2.0 | 0.5 | --- | 4.5 | 6.5 | 10.0 | 12.5 | 13.0 |
| 3 | 8.0 | 3.5 | 1.5 | 0.5 | 1.5 | 2.0 | --- | 4.5 | 7.5 | 10.0 | 13.0 | 14.0 |
| 4 | 10.0 | 2.0 | 1.5 | 0.5 | 1.0 | 1.5 | --- | 5.0 | 7.0 | 10.5 | 13.0 | 13.5 |
| 5 | 10.0 | 3.5 | 2.0 | 0.5 | 1.0 | 1.5 | --- | 5.5 | 7.5 | 10.0 | 14.0 | 12.5 |
| 6 | 7.0 | 4.0 | 3.5 | 0.5 | 0.5 | 1.0 | --- | 5.0 | 8.0 | 9.0 | 13.0 | 12.5 |
| 7 | 6.0 | 4.0 | 3.0 | 1.0 | 0.5 | 2.0 | --- | 6.0 | 8.0 | 9.5 | 13.0 | 13.0 |
| 8 | 7.0 | 4.0 | 2.0 | 1.5 | 1.0 | 2.0 | --- | 5.5 | 8.5 | 9.0 | 12.5 | 13.5 |
| 9 | 7.0 | 3.5 | 1.5 | 0.5 | 2.0 | 1.5 | --- | 5.5 | 8.0 | 9.0 | 13.0 | 13.0 |
| 10 | 7.5 | 3.5 | 1.0 | 0.5 | 2.5 | 2.0 | --- | 5.5 | 8.0 | 10.0 | 14.5 | 12.5 |
| 11 | 8.0 | 4.0 | 1.5 | 0.5 | 3.0 | 2.5 | --- | 5.5 | 8.5 | 9.5 | 12.5 | 14.0 |
| 12 | 8.0 | 3.5 | 1.0 | 0.0 | 3.5 | 3.0 | --- | 7.5 | 8.5 | 9.0 | 13.0 | 13.0 |
| 13 | 7.0 | 3.5 | 1.5 | 0.0 | 4.5 | 3.0 | --- | 6.0 | 8.0 | 9.0 | 15.0 | 13.0 |
| 14 | 5.5 | 3.0 | 1.0 | 0.0 | 4.0 | 2.0 | --- | 6.0 | 8.0 | 10.0 | 12.0 | 10.0 |
| 15 | 5.0 | 3.5 | 1.5 | 0.5 | 3.5 | 3.0 | --- | 5.0 | 8.0 | 12.0 | 12.5 | 11.0 |
| 16 | 5.5 | 4.5 | 1.0 | 2.0 | 2.5 | 2.0 | --- | 6.0 | 8.5 | 10.5 | 12.0 | 11.0 |
| 17 | 8.0 | 4.0 | 1.0 | 2.0 | 1.5 | 1.0 | --- | 6.0 | 8.5 | 10.0 | 13.0 | 9.0 |
| 18 | 9.0 | 3.0 | 0.5 | 2.5 | 1.0 | 1.0 | --- | 6.0 | 9.0 | 10.0 | 13.0 | 12.0 |
| 19 | 6.5 | 2.0 | 0.5 | 2.5 | 2.5 | 1.5 | --- | 6.5 | 9.0 | 10.0 | 13.0 | 11.0 |
| 20 | 6.0 | 2.0 | 0.5 | 1.5 | 1.0 | 2.0 | --- | 6.0 | 8.5 | 10.5 | 14.0 | 9.0 |
| 21 | 6.5 | --- | 0.5 | 1.5 | 0.5 | 2.5 | --- | 6.5 | 9.0 | 13.5 | 14.5 | 8.5 |
| 22 | 8.5 | --- | 0.5 | 1.0 | 1.5 | 1.0 | --- | 6.5 | 11.5 | 11.0 | 13.5 | 8.5 |
| 23 | 7.0 | 1.0 | 0.5 | 2.0 | 2.0 | 1.0 | --- | 6.5 | 10.0 | 11.5 | 14.0 | 9.0 |
| 24 | 6.0 | 3.0 | 0.5 | 2.0 | 2.5 | 3.0 | --- | 7.0 | 10.0 | 11.0 | 15.0 | 9.0 |
| 25 | 4.5 | 2.0 | 1.0 | 1.5 | 2.0 | 2.5 | --- | 7.0 | 10.0 | 11.0 | 14.5 | 10.0 |
| 26 | 4.0 | 2.0 | 1.5 | 1.0 | 1.0 | 2.5 | --- | 7.5 | 9.0 | 10.5 | 13.5 | 10.5 |
| 27 | 4.5 | 2.5 | 1.0 | 3.0 | 0.5 | 3.0 | --- | 8.0 | 8.5 | 12.0 | 14.0 | 8.5 |
| 28 | 3.5 | 2.5 | 1.5 | 2.5 | 1.0 | 4.0 | --- | 7.5 | 8.0 | 11.0 | 13.5 | 8.5 |
| 29 | 3.0 | 3.5 | 1.5 | 3.0 | --- | 3.0 | 4.0 | 7.0 | 8.0 | 12.0 | 14.0 | 8.0 |
| 30 | 3.5 | 2.5 | 1.0 | 1.5 | --- | 3.5 | 4.0 | 7.0 | 9.0 | 11.5 | 14.5 | 7.5 |
| 31 | 3.0 | --- | 2.0 | 0.5 | --- | 3.5 | --- | 6.5 | --- | 11.0 | 15.0 | --- |
| MONTH | 6.5 | 3.0 | 1.5 | 1.0 | 2.0 | 2.0 | --- | 6.0 | 8.5 | 10.5 | 13.5 | 11.0 |
| YEAR | 6.0 | | | | | | | | | | | |

## 06088300 MUDDY CREEK NEAR VAUGHN, MONT.

LOCATION.--Lat 47°37'30", long 111°38'05", in NW¼NE¼ sec.32, T.22 N., R.1 E., Cascade County, at gaging station at bridge on county road and 6.2 miles northwest of Vaughn.

DRAINAGE AREA.--282 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1968 to September 1971.
Water temperatures: July 1968 to September 1971.
Sediment records: July 1968 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 1,180 mg/l Apr. 19-30; minimum, 332 mg/l June 1-11.
Hardness: Maximum, 630 mg/l Apr. 19-30; minimum, 230 mg/l June 1-11.
Specific conductance: Maximum daily, 1,880 micromhos Mar. 27; minimum daily, 467 micromhos June 7.
Water temperatures: Maximum, 25.5°C July 23; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 2,760 mg/l May 7; minimum daily, 25 mg/l Nov. 15.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-07 | -- | 174 | -- | 6.1 | -- | 51 | 36 | 31 | 1.9 | 269 | 0 | 120 |
| 14-21 | -- | 87 | -- | 5.4 | -- | 49 | 62 | 67 | 2.6 | 344 | 0 | 230 |
| 27-31 | -- | 67 | -- | 6.4 | -- | 58 | 68 | 74 | 2.6 | 357 | 0 | 280 |
| NOV. | | | | | | | | | | | | |
| 01-07 | -- | 69 | -- | 4.9 | -- | 53 | 59 | 73 | 3.0 | 339 | 0 | 250 |
| 12-20 | -- | 57 | -- | 5.4 | -- | 63 | 61 | 79 | 3.0 | 375 | 0 | 260 |
| DEC. | | | | | | | | | | | | |
| 09-14 | -- | 53 | -- | 8.5 | -- | 41 | 67 | 74 | 2.6 | 316 | 0 | 270 |
| 15-31 | -- | 44 | -- | 9.0 | -- | 58 | 71 | 73 | 2.6 | 371 | 1 | 260 |
| JAN. | | | | | | | | | | | | |
| 01-11 | -- | 34 | -- | 11 | 100 | 52 | 68 | 73 | 2.5 | 352 | 0 | 250 |
| 15-27 | -- | 52 | -- | 10 | 120 | 70 | 69 | 77 | 5.1 | 368 | 0 | 300 |
| FEB. | | | | | | | | | | | | |
| 01-11 | -- | 33 | -- | 9.2 | 20 | 58 | 58 | 74 | 3.8 | 302 | 17 | 270 |
| 14-27 | -- | 55 | -- | 7.9 | 40 | 60 | 72 | 140 | 5.8 | 267 | -- | 480 |
| MAR. | | | | | | | | | | | | |
| 21-29 | -- | 34 | -- | 7.4 | 20 | 74 | 96 | 150 | 3.2 | 339 | 0 | 600 |
| APR. | | | | | | | | | | | | |
| 01-18 | -- | 31 | -- | 2.5 | 40 | 60 | 89 | 130 | 2.8 | 328 | 0 | 460 |
| 19-30 | -- | 32 | -- | 10 | 20 | 71 | 110 | 150 | 3.1 | 340 | 0 | 620 |
| MAY | | | | | | | | | | | | |
| 01-07 | -- | 35 | -- | 11 | 10 | 58 | 75 | 110 | 3.2 | 302 | 0 | 430 |
| 08-23 | -- | 148 | -- | 9.5 | 10 | 52 | 35 | 46 | 1.8 | 229 | 0 | 180 |
| 25-31 | -- | 158 | -- | 8.1 | 10 | 46 | 34 | 37 | 1.8 | 233 | 0 | 140 |
| JUNE | | | | | | | | | | | | |
| 01-11 | -- | 214 | -- | 7.0 | 10 | 43 | 29 | 30 | 1.7 | 213 | 0 | 110 |
| 13-22 | -- | 128 | -- | 6.4 | 10 | 46 | 39 | 38 | 2.3 | 292 | 0 | 120 |
| 27-30 | -- | 199 | -- | 6.9 | 10 | 46 | 39 | 40 | 2.6 | 293 | 0 | 110 |
| JULY | | | | | | | | | | | | |
| 01-08 | -- | 292 | -- | 7.7 | 10 | 42 | 34 | 32 | 2.2 | 265 | 0 | 93 |
| 13-31 | -- | 231 | -- | 8.5 | 10 | 45 | 39 | 38 | 2.6 | 304 | 0 | 110 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 341 | -- | 7.8 | 10 | 45 | 34 | 27 | 1.5 | 282 | 0 | 89 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 205 | -- | 6.0 | 10 | 42 | 34 | 30 | 1.5 | 248 | 0 | 110 |
| WTD. AVG. | -- | -- | -- | 7.5 | 15 | 47 | 41 | 43 | 2.1 | 279 | 0 | 149 |
| TIME WTD. AVG. | -- | 136 | -- | 7.6 | 26 | 53 | 55 | 67 | 2.6 | 300 | 1 | 242 |
| TONS PER DAY | -- | -- | -- | 2.7 | 0 | 17 | 15 | 16 | .8 | 102 | 0 | 55 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 14... | 1230 | 101 | -- | 6.7 | 10 | 56 | 53 | 70 | 2.1 | 338 | 0 | 230 |
| JAN., 1971 | | | | | | | | | | | | |
| 20... | 1530 | 75 | .0 | 7.9 | 240 | 53 | 53 | 71 | 9.1 | 262 | 0 | 260 |
| MAY | | | | | | | | | | | | |
| 13... | 1100 | 118 | 13.5 | 7.6 | 60 | 45 | 33 | 35 | 1.5 | 221 | -- | 150 |
| JULY | | | | | | | | | | | | |
| 08... | 1430 | 335 | 18.0 | 6.2 | 10 | 41 | 34 | 30 | 1.7 | 260 | 0 | 95 |

06088300 MUDDY CREEK NEAR VAUGHN, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment discharge: Maximum daily, 2,030 tons June 1; minimum daily, 2.6 tons Apr. 7, 15.

Period of record:
Dissolved solids: Maximum, 2,280 mg/l Apr. 28 to May 12, 1970; minimum, 313 mg/l July 1-10, 1970.
Hardness: Maximum, 939 mg/l Apr. 28 to May 12, 1970; minimum, 216 mg/l June 15-30, 1970.
Specific conductance: Maximum daily, 4,130 micromhos May 11, 1970; minimum daily, 365 micromhos Feb. 20, 1969.
Water temperatures: Maximum, 25.5°C July 23, 1971; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 4,230 mg/l Mar. 21, 1969; minimum daily observed, 11 mg/l Oct. 19, 1968.
Sediment discharge: Maximum daily, 10,700 tons Mar. 19, 1969; minimum daily observed, 1.7 tons Oct. 24, 28, 1968.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Samples for chemical analysis and sediment discharge were not obtained for many days during the winter period. Stream frozen Nov. 21 to Mar. 25.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-07 | 3.1 | .6 | -- | -- | 382 | .52 | 180 | 270 | 54 | .8 | 614 | 7.8 |
| 14-21 | 6.0 | 1.0 | -- | -- | 604 | .84 | 144 | 380 | 95 | 1.5 | 920 | 8.1 |
| 27-31 | 6.0 | .7 | -- | -- | 676 | .93 | 124 | 420 | 130 | 1.6 | 1010 | 8.2 |
| NOV. | | | | | | | | | | | | |
| 01-07 | 6.6 | 1.0 | -- | -- | 625 | .86 | 118 | 370 | 95 | 1.6 | 1010 | 8.1 |
| 12-20 | 7.4 | 1.1 | -- | -- | 680 | .94 | 106 | 410 | 100 | 1.7 | 1030 | 8.2 |
| DEC. | | | | | | | | | | | | |
| 09-14 | 9.6 | 1.1 | -- | -- | 631 | .87 | 91.7 | 380 | 120 | 1.7 | 942 | 8.2 |
| 15-31 | 6.8 | 1.2 | -- | -- | 670 | .91 | 79.8 | 430 | 130 | 1.5 | 1020 | 8.3 |
| JAN. | | | | | | | | | | | | |
| 01-11 | 6.5 | 1.1 | .30 | .05 | 640 | .87 | 58.8 | 410 | 120 | 1.6 | 979 | 8.4 |
| 15-27 | 9.6 | 1.3 | .30 | .00 | 720 | .98 | 101 | 460 | 160 | 1.6 | 1070 | 8.4 |
| FEB. | | | | | | | | | | | | |
| 01-11 | 8.6 | 1.3 | 2.6 | .06 | 677 | .92 | 60.3 | 380 | 110 | 1.6 | 953 | 8.4 |
| 14-27 | 11 | 1.1 | 2.4 | .21 | 920 | 1.25 | 137 | 450 | 230 | 2.9 | 1260 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 21-29 | 3.3 | .8 | 4.3 | .03 | 1120 | 1.52 | 103 | 580 | 300 | 2.7 | 1580 | 8.3 |
| APR. | | | | | | | | | | | | |
| 01-18 | 12 | .8 | 3.3 | .00 | 933 | 1.27 | 78.1 | 520 | 250 | 2.5 | 1350 | 8.3 |
| 19-30 | 31 | .9 | 3.3 | .03 | 1180 | 1.60 | 102 | 630 | 350 | 2.6 | 1580 | 8.3 |
| MAY | | | | | | | | | | | | |
| 01-07 | 9.9 | 1.2 | 2.1 | .03 | 856 | 1.16 | 80.9 | 450 | 210 | 2.2 | 1250 | 8.3 |
| 08-23 | 6.7 | .6 | .86 | .06 | 448 | .61 | 179 | 270 | 86 | 1.2 | 685 | 8.0 |
| 25-31 | 3.3 | .7 | .45 | .06 | 388 | .53 | 166 | 250 | 64 | 1.0 | 624 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 01-11 | 2.8 | .8 | .62 | .00 | 332 | .45 | 192 | 230 | 52 | .9 | 551 | 7.9 |
| 13-22 | 3.3 | .8 | .49 | .06 | 402 | .55 | 139 | 280 | 36 | 1.0 | 638 | 8.1 |
| 27-30 | 2.7 | .5 | .64 | .03 | 395 | .54 | 212 | 280 | 35 | 1.0 | 642 | 8.2 |
| JULY | | | | | | | | | | | | |
| 01-08 | 3.1 | 1.0 | .44 | .03 | 347 | .47 | 274 | 240 | 27 | .9 | 566 | 8.2 |
| 13-31 | 3.4 | 1.0 | .63 | .03 | 400 | .54 | 249 | 270 | 24 | 1.0 | 642 | 8.1 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 1.7 | .5 | .48 | .00 | 347 | .47 | 319 | 250 | 21 | .7 | 572 | 8.2 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 2.2 | .7 | .62 | .03 | 351 | .48 | 194 | 240 | 41 | .8 | 567 | 8.3 |
| WTD. AVG. | 3.9 | .8 | .74 | .03 | 436 | .59 | -- | 286 | 59 | 1.0 | 686 | 8.2 |
| TIME WTD. AVG. | 6.7 | .9 | 1.3 | .04 | 590 | .80 | -- | 358 | 112 | 1.5 | 886 | 8.2 |
| TONS PER DAY | 1.4 | .3 | .30 | .01 | 160 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| OCT. | | | | | | | | | | | | |
| 14... | 6.4 | 1.0 | -- | -- | 596 | .86 | 173 | 360 | 81 | 1.6 | 945 | 8.1 |
| JAN., 1971 | | | | | | | | | | | | |
| 20... | 10 | .9 | .00 | .70 | 590 | .80 | 119 | 350 | 140 | 1.7 | 849 | 7.6 |
| MAY | | | | | | | | | | | | |
| 13... | 3.3 | .4 | .60 | .09 | 387 | .53 | 123 | 250 | 67 | 1.0 | 635 | 7.9 |
| JULY | | | | | | | | | | | | |
| 08... | 2.4 | .8 | .79 | .25 | 343 | .47 | 310 | 240 | 29 | .8 | 569 | 7.8 |

06088300 MUDDY CREEK NEAR VAUGHN, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 14... | 1230 | 101 | .000 | 230 | 45 |
| NOV. | | | | | |
| 17... | 1300 | 56 | .050 | -- | -- |
| DEC. | | | | | |
| 08... | 1500 | 60 | .000 | -- | -- |
| JAN., 1971 | | | | | |
| 20... | 1530 | 75 | .23 | 370 | 100 |
| FEB. | | | | | |
| 10... | 1300 | 40 | .040 | -- | -- |
| MAR. | | | | | |
| 11... | 0900 | 39 | .030 | -- | -- |
| APR. | | | | | |
| 15... | 0930 | 30 | .020 | -- | -- |
| MAY | | | | | |
| 13... | 1100 | 118 | .050 | 110 | 20 |
| JUNE | | | | | |
| 09... | 1200 | 177 | .050 | -- | -- |
| JULY | | | | | |
| 08... | 1430 | 335 | .090 | 120 | 12 |
| AUG. | | | | | |
| 05... | 0945 | 363 | .040 | -- | -- |
| SEP. | | | | | |
| 09... | 1200 | 189 | .070 | -- | -- |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 598 | 949 | --- | 1010 | 1090 | --- | 1800 | 1330 | 571 | 584 | 551 | 537 |
| 2 | 592 | 990 | --- | 1080 | 1040 | --- | --- | 1290 | 627 | 573 | 551 | 532 |
| 3 | 586 | 919 | --- | 1010 | 1030 | --- | 1370 | 1290 | 534 | 567 | 540 | 515 |
| 4 | 592 | --- | --- | 1040 | 1010 | --- | --- | 1350 | 537 | 562 | 571 | 533 |
| 5 | 592 | --- | --- | 1080 | 1090 | --- | --- | 1350 | 532 | 562 | 561 | 562 |
| 6 | 689 | 983 | --- | 1000 | --- | --- | 1320 | 1410 | --- | 562 | 584 | 582 |
| 7 | 702 | 974 | --- | 1010 | 939 | --- | 1330 | 1040 | 467 | --- | 625 | 563 |
| 8 | --- | --- | --- | 993 | 1000 | --- | 1320 | 696 | --- | 567 | 618 | 562 |
| 9 | --- | --- | 1070 | 1010 | --- | --- | 1350 | 656 | 497 | --- | 536 | 562 |
| 10 | --- | --- | 1060 | 977 | 993 | --- | 1330 | --- | --- | --- | 560 | 582 |
| 11 | --- | --- | 1090 | 916 | 983 | --- | 1350 | --- | 550 | --- | 572 | 645 |
| 12 | --- | 1010 | 1100 | --- | --- | --- | 1380 | 689 | --- | --- | 595 | 608 |
| 13 | --- | 1020 | 939 | --- | --- | --- | 1330 | 668 | 495 | 608 | 580 | 606 |
| 14 | 944 | 1040 | 729 | --- | 1330 | --- | 1320 | 532 | 618 | 641 | 553 | 662 |
| 15 | 918 | 1020 | 1140 | 1010 | --- | --- | --- | 533 | 674 | 655 | 550 | 664 |
| 16 | 910 | --- | 1130 | --- | 1530 | --- | 1330 | 522 | 608 | 663 | 566 | 641 |
| 17 | --- | --- | 1050 | 1000 | --- | --- | 1320 | 533 | 661 | 667 | 566 | 579 |
| 18 | --- | 1060 | 1110 | 977 | --- | --- | 1370 | 532 | 661 | 688 | 572 | 641 |
| 19 | 947 | 1080 | 1120 | 980 | 1280 | --- | 1680 | 653 | 677 | 696 | 608 | 641 |
| 20 | 947 | 1080 | 1070 | 1010 | 1330 | --- | 1790 | 827 | 679 | 689 | 621 | 662 |
| 21 | 971 | --- | 1070 | 1210 | 1280 | 1540 | 1690 | 810 | 677 | 724 | 600 | 596 |
| 22 | --- | --- | 1040 | 1220 | --- | 1600 | 1700 | 910 | 665 | 724 | 566 | 557 |
| 23 | --- | --- | 1070 | 1080 | --- | --- | 1690 | 732 | --- | 703 | 546 | 542 |
| 24 | --- | --- | 1080 | 1050 | --- | 1840 | 1520 | --- | --- | 739 | 560 | 540 |
| 25 | --- | --- | 1000 | 1080 | 1430 | 1520 | 1460 | 573 | --- | 720 | 546 | 552 |
| 26 | --- | --- | 1030 | 1170 | --- | 1320 | 1480 | 573 | --- | 653 | 530 | 568 |
| 27 | 1010 | --- | 1030 | 1160 | 1130 | 1880 | 1500 | 594 | 679 | 702 | 543 | 585 |
| 28 | 981 | --- | 1030 | --- | --- | 1560 | 1480 | 705 | 676 | 766 | 584 | 594 |
| 29 | 1110 | --- | 1000 | --- | --- | 1320 | 1500 | --- | --- | 760 | 604 | 607 |
| 30 | 1140 | --- | 1000 | --- | --- | --- | 1440 | 586 | 590 | 722 | 703 | 662 |
| 31 | 971 | --- | 1020 | --- | --- | --- | --- | 625 | --- | 705 | 583 | --- |
| MONTH | - -- | --- | --- | --- | --- | --- | 1470 | 815 | --- | 662 | 576 | 589 |
| YEAR | 889 | | | | | | | | | | | |

06088300 MUDDY CREEK NEAR VAUGHN, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 18.0 | --- | 18.5 | 22.0 | 15.0 |
| 2 | 15.5 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | 15.5 | 14.0 | 20.0 | 24.0 | 16.0 |
| 3 | 15.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.5 | 16.0 | 16.5 | 17.0 | 22.0 | 17.0 |
| 4 | 15.0 | --- | 0.0 | 0.0 | 0.0 | 0.0 | --- | 14.5 | 15.0 | 12.5 | 23.5 | 12.0 |
| 5 | 10.5 | --- | 0.0 | 0.0 | 0.0 | 0.0 | --- | 11.0 | 12.0 | 17.0 | 24.5 | 12.0 |
| 6 | 4.5 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 7.5 | --- | 13.5 | 18.0 | 14.0 |
| 7 | 3.0 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 15.5 | 16.5 | --- | 24.0 | 18.0 |
| 8 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 12.5 | 15.5 | --- | 19.5 | 18.0 | 19.0 |
| 9 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 10.5 | 19.0 | --- | 24.0 | 17.0 |
| 10 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 | --- | --- | --- | 24.0 | 19.0 |
| 11 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 | --- | 15.0 | --- | 24.0 | 14.0 |
| 12 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 19.0 | --- | --- | 23.5 | 17.0 |
| 13 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 12.5 | 17.0 | 19.5 | 21.0 | 13.0 |
| 14 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 13.5 | 14.0 | 11.5 | 24.0 | 17.0 | 14.5 |
| 15 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | --- | 16.5 | 17.0 | 24.0 | 21.5 | 12.0 |
| 16 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 14.0 | 10.5 | 22.0 | 25.0 | 15.0 | 10.0 |
| 17 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 12.0 | 8.0 | 14.0 | 25.0 | 22.0 | 10.0 |
| 18 | --- | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 8.5 | 24.0 | 23.0 | 15.0 | 5.0 |
| 19 | --- | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.5 | 7.0 | 17.0 | 25.0 | 23.0 | 10.0 |
| 20 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 8.5 | --- | 24.0 | 14.0 | 8.5 |
| 21 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 6.0 | 20.0 | 24.0 | 15.0 | 12.0 |
| 22 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.5 | 9.0 | 18.5 | 25.0 | 16.0 | 14.0 |
| 23 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 17.0 | --- | 25.5 | 19.0 | 15.0 |
| 24 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.0 | --- | --- | 14.0 | 21.0 | 14.0 |
| 25 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 20.0 | --- | 14.0 | 21.5 | 12.0 |
| 26 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 7.5 | 20.0 | --- | 22.0 | 23.0 | 11.0 |
| 27 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 11.5 | 18.0 | 15.0 | 18.5 | 23.0 | 11.0 |
| 28 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 11.0 | 18.0 | --- | 18.0 | 17.0 | 10.5 |
| 29 | 6.0 | 0.0 | 0.0 | 0.0 | --- | 1.0 | 6.5 | --- | 10.0 | 20.0 | 19.0 | 10.0 |
| 30 | 6.5 | 0.0 | 0.0 | 0.0 | --- | --- | 13.0 | 15.0 | 14.5 | 22.0 | 17.0 | 8.0 |
| 31 | 4.5 | --- | 0.0 | 0.0 | --- | --- | --- | 12.0 | --- | 16.0 | 17.5 | --- |
| MONTH | --- | --- | 0.0 | 0.0 | 0.0 | 0.5 | 9.0 | 13.5 | --- | 20.5 | 20.5 | 13.0 |
| YEAR | 8.5 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM |
|---|---|---|---|---|---|---|---|---|---|---|
| MAY | | | | | | | | | | |
| 07... | 1830 | 15.5 | 124 | 7810 | 2610 | 57 | 80 | 98 | 100 | -- |
| 13... | 1140 | 13.5 | 118 | 691 | 220 | 48 | 69 | 94 | 99 | 100 |

06088300 MUDDY CREEK NEAR VAUGHN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 137 | 111 | 41 | 72 | 53 | 10 | 55 | 60 | 8.9 |
| 2 | 187 | 110 | 56 | 70 | 55 | 10 | 50 | 64 | 8.6 |
| 3 | 185 | 115 | 57 | 69 | 54 | 10 | 50 | 66 | 8.9 |
| 4 | 182 | 301 | 148 | 68 | 59 | 11 | 50 | 64 | 8.6 |
| 5 | 184 | 459 | 228 | 69 | 65 | 12 | 55 | 60 | 8.9 |
| 6 | 203 | 188 | 103 | 69 | 67 | 12 | 60 | 58 | 9.4 |
| 7 | 160 | 103 | 44 | 66 | 49 | 8.7 | 65 | 60 | 11 |
| 8 | 117 | 88 | 28 | 65 | 47 | 8.2 | 60 | 65 | 11 |
| 9 | 103 | 72 | 20 | 65 | 47 | 8.2 | 55 | 98 | 15 |
| 10 | 101 | 65 | 18 | 63 | 47 | 8.0 | 50 | 106 | 14 |
| 11 | 92 | 63 | 16 | 62 | 44 | 7.4 | 55 | 92 | 14 |
| 12 | 100 | 66 | 18 | 61 | 41 | 6.8 | 55 | 99 | 15 |
| 13 | 106 | 63 | 18 | 59 | 34 | 5.4 | 50 | 118 | 16 |
| 14 | 101 | 60 | 16 | 59 | 33 | 5.3 | 55 | 118 | 18 |
| 15 | 101 | 44 | 12 | 59 | 25 | 4.0 | 60 | 111 | 18 |
| 16 | 97 | 48 | 13 | 57 | 27 | 4.2 | 60 | 100 | 16 |
| 17 | 92 | 53 | 13 | 56 | 39 | 5.9 | 50 | 78 | 11 |
| 18 | 79 | 55 | 12 | 56 | 53 | 8.0 | 40 | 95 | 10 |
| 19 | 76 | 54 | 11 | 55 | 51 | 7.6 | 35 | 101 | 9.5 |
| 20 | 74 | 45 | 9.0 | 50 | 57 | 7.7 | 30 | 82 | 6.6 |
| 21 | 73 | 51 | 10 | 45 | 75 | 9.1 | 30 | 81 | 6.6 |
| 22 | 70 | 63 | 12 | 50 | 115 | 16 | 35 | 85 | 8.0 |
| 23 | 69 | 62 | 12 | 50 | 125 | 17 | 35 | 86 | 8.1 |
| 24 | 68 | 60 | 11 | 55 | 113 | 17 | 40 | 89 | 9.6 |
| 25 | 64 | 58 | 10 | 55 | 107 | 16 | 40 | 94 | 10 |
| 26 | 63 | 59 | 10 | 50 | 96 | 13 | 45 | 87 | 11 |
| 27 | 61 | 54 | 8.9 | 50 | 82 | 11 | 45 | 77 | 9.4 |
| 28 | 59 | 29 | 4.6 | 50 | 67 | 9.0 | 45 | 85 | 10 |
| 29 | 61 | 152 | 25 | 55 | 61 | 9.1 | 50 | 77 | 10 |
| 30 | 77 | 204 | 42 | 60 | 58 | 9.4 | 50 | 56 | 7.6 |
| 31 | 75 | 79 | 16 | -- | -- | -- | 50 | 70 | 9.5 |
| TOTAL | 3217 | -- | 1042.5 | 1770 | -- | 287.0 | 1505 | -- | 338.2 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 40 | 56 | 6.0 | 30 | 62 | 5.0 | 30 | 158 | 13 |
| 2 | 30 | 51 | 4.1 | 35 | 57 | 5.4 | 32 | 152 | 13 |
| 3 | 30 | 71 | 5.8 | 35 | 53 | 5.0 | 35 | 137 | 13 |
| 4 | 30 | 71 | 5.8 | 30 | 59 | 4.8 | 37 | 97 | 9.7 |
| 5 | 30 | 79 | 6.4 | 30 | 60 | 4.9 | 40 | 76 | 8.2 |
| 6 | 35 | 77 | 7.3 | 25 | 70 | 4.7 | 40 | 69 | 7.5 |
| 7 | 40 | 75 | 8.1 | 25 | 116 | 7.8 | 38 | 69 | 7.1 |
| 8 | 40 | 75 | 8.1 | 30 | 126 | 10 | 40 | 98 | 11 |
| 9 | 35 | 75 | 7.1 | 35 | 103 | 9.7 | 43 | 63 | 7.3 |
| 10 | 35 | 77 | 7.3 | 40 | 103 | 11 | 40 | 113 | 12 |
| 11 | 30 | 110 | 8.9 | 50 | 136 | 18 | 39 | 222 | 23 |
| 12 | 25 | 94 | 6.3 | 70 | 151 | 29 | 37 | 263 | 26 |
| 13 | 20 | 93 | 5.0 | 110 | 365 | 108 | 37 | 251 | 25 |
| 14 | 20 | 91 | 4.9 | 100 | 350 | 95 | 35 | 247 | 23 |
| 15 | 25 | 88 | 5.9 | 90 | 332 | 81 | 33 | 240 | 21 |
| 16 | 30 | 96 | 7.8 | 80 | 333 | 72 | 30 | 260 | 21 |
| 17 | 35 | 119 | 11 | 70 | 303 | 57 | 28 | 240 | 18 |
| 18 | 40 | 126 | 14 | 60 | 264 | 43 | 31 | 263 | 22 |
| 19 | 60 | 229 | 37 | 50 | 287 | 39 | 32 | 259 | 22 |
| 20 | 75 | 184 | 37 | 45 | 333 | 40 | 30 | 221 | 18 |
| 21 | 70 | 96 | 18 | 50 | 317 | 43 | 25 | 209 | 14 |
| 22 | 65 | 96 | 17 | 45 | 302 | 37 | 25 | 226 | 15 |
| 23 | 60 | 114 | 18 | 42 | 272 | 31 | 30 | 206 | 17 |
| 24 | 55 | 157 | 23 | 40 | 210 | 23 | 40 | 195 | 21 |
| 25 | 50 | 167 | 23 | 37 | 193 | 19 | 35 | 199 | 19 |
| 26 | 50 | 94 | 13 | 35 | 187 | 18 | 37 | 228 | 23 |
| 27 | 55 | 67 | 9.9 | 32 | 183 | 16 | 39 | 244 | 26 |
| 28 | 60 | 118 | 19 | 30 | 154 | 12 | 34 | 238 | 22 |
| 29 | 50 | 76 | 10 | -- | -- | -- | 37 | 191 | 19 |
| 30 | 35 | 86 | 8.1 | -- | -- | -- | 39 | 169 | 18 |
| 31 | 30 | 112 | 9.1 | -- | -- | -- | 37 | 153 | 15 |
| TOTAL | 1285 | -- | 371.9 | 1351 | -- | 849.3 | 1085 | -- | 529.8 |

06088300 MUDDY CREEK NEAR VAUGHN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 32 | 137 | 12 | 29 | 81 | 6.3 | 311 | 2420 | 2030 |
| 2 | 35 | 121 | 11 | 29 | 85 | 6.7 | 230 | 905 | 562 |
| 3 | 33 | 104 | 9.3 | 29 | 92 | 7.2 | 199 | 825 | 443 |
| 4 | 32 | 84 | 7.3 | 28 | 107 | 8.1 | 194 | 770 | 403 |
| 5 | 32 | 60 | 5.2 | 30 | 112 | 9.1 | 168 | 390 | 177 |
| 6 | 32 | 37 | 3.2 | 32 | 160 | 14 | 206 | 896 | 498 |
| 7 | 33 | 29 | 2.6 | 68 | 2760 | 861 | 279 | 1140 | 859 |
| 8 | 31 | 40 | 3.3 | 143 | 2610 | 1050 | 213 | 544 | 313 |
| 9 | 31 | 50 | 4.2 | 96 | 903 | 234 | 171 | 418 | 193 |
| 10 | 31 | 88 | 7.4 | 77 | 814 | 169 | 180 | 413 | 201 |
| 11 | 28 | 83 | 6.3 | 118 | 884 | 282 | 208 | 627 | 352 |
| 12 | 31 | 43 | 3.6 | 129 | 928 | 323 | 177 | 483 | 231 |
| 13 | 29 | 37 | 2.9 | 104 | 762 | 214 | 156 | 287 | 121 |
| 14 | 29 | 34 | 2.7 | 107 | 581 | 168 | 171 | 483 | 223 |
| 15 | 29 | 33 | 2.6 | 125 | 521 | 176 | 129 | 331 | 115 |
| 16 | 29 | 112 | 8.8 | 135 | 609 | 222 | 117 | 317 | 100 |
| 17 | 32 | 97 | 8.4 | 194 | 856 | 448 | 111 | 264 | 79 |
| 18 | 35 | 90 | 8.5 | 192 | 907 | 470 | 115 | 172 | 53 |
| 19 | 35 | 91 | 8.6 | 168 | 958 | 435 | 135 | 588 | 214 |
| 20 | 35 | 99 | 9.4 | 212 | 1860 | 1070 | 120 | 626 | 203 |
| 21 | 34 | 88 | 8.1 | 199 | 958 | 515 | 113 | 844 | 258 |
| 22 | 32 | 101 | 8.7 | 196 | 747 | 395 | 112 | 383 | 116 |
| 23 | 32 | 97 | 8.4 | 180 | 725 | 352 | 122 | 437 | 144 |
| 24 | 31 | 96 | 8.0 | 168 | 767 | 348 | 113 | 335 | 102 |
| 25 | 31 | 93 | 7.8 | 160 | 687 | 297 | 118 | 306 | 97 |
| 26 | 31 | 85 | 7.1 | 163 | 581 | 256 | 143 | 361 | 139 |
| 27 | 31 | 82 | 6.9 | 147 | 463 | 184 | 166 | 374 | 168 |
| 28 | 31 | 90 | 7.5 | 125 | 409 | 138 | 182 | 413 | 203 |
| 29 | 30 | 113 | 9.2 | 127 | 498 | 171 | 212 | 374 | 214 |
| 30 | 29 | 88 | 6.9 | 132 | 584 | 221 | 235 | 548 | 348 |
| 31 | -- | -- | -- | 251 | 1630 | 1100 | -- | -- | -- |
| TOTAL | 946 | -- | 205.9 | 3893 | -- | 10150.4 | 5106 | -- | 9159 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 251 | 1110 | 752 | 425 | 675 | 775 | 373 | 653 | 658 |
| 2 | 239 | 744 | 480 | 408 | 453 | 499 | 368 | 387 | 385 |
| 3 | 277 | 583 | 436 | 398 | 433 | 465 | 340 | 351 | 322 |
| 4 | 283 | 766 | 585 | 395 | 390 | 416 | 331 | 356 | 318 |
| 5 | 303 | 888 | 726 | 353 | 385 | 367 | 309 | 337 | 281 |
| 6 | 315 | 896 | 762 | 355 | 384 | 368 | 267 | 237 | 171 |
| 7 | 350 | 1080 | 1020 | 365 | 477 | 470 | 224 | 158 | 96 |
| 8 | 321 | 600 | 520 | 360 | 572 | 556 | 194 | 131 | 69 |
| 9 | 305 | 514 | 423 | 418 | 587 | 662 | 177 | 113 | 54 |
| 10 | 253 | 398 | 272 | 378 | 384 | 392 | 168 | 98 | 44 |
| 11 | 257 | 360 | 250 | 380 | 296 | 304 | 149 | 92 | 37 |
| 12 | 283 | 352 | 269 | 311 | 266 | 223 | 138 | 90 | 34 |
| 13 | 239 | 266 | 172 | 301 | 319 | 259 | 137 | 76 | 28 |
| 14 | 226 | 259 | 158 | 403 | 480 | 522 | 120 | 59 | 19 |
| 15 | 203 | 215 | 118 | 365 | 376 | 371 | 121 | 61 | 20 |
| 16 | 179 | 199 | 96 | 331 | 287 | 256 | 135 | 52 | 19 |
| 17 | 171 | 184 | 85 | 315 | 312 | 265 | 187 | 131 | 66 |
| 18 | 172 | 171 | 79 | 325 | 292 | 256 | 184 | 107 | 53 |
| 19 | 166 | 178 | 80 | 295 | 479 | 382 | 179 | 81 | 39 |
| 20 | 169 | 171 | 78 | 289 | 550 | 429 | 212 | 136 | 78 |
| 21 | 180 | 195 | 95 | 307 | 543 | 450 | 199 | 146 | 78 |
| 22 | 179 | 258 | 125 | 345 | 493 | 459 | 182 | 114 | 56 |
| 23 | 185 | 258 | 129 | 338 | 448 | 409 | 182 | 110 | 54 |
| 24 | 182 | 233 | 114 | 307 | 357 | 296 | 192 | 112 | 58 |
| 25 | 219 | 321 | 190 | 335 | 339 | 307 | 194 | 97 | 51 |
| 26 | 243 | 421 | 276 | 321 | 346 | 300 | 192 | 74 | 38 |
| 27 | 210 | 285 | 162 | 281 | 267 | 203 | 187 | 68 | 34 |
| 28 | 259 | 494 | 345 | 271 | 270 | 198 | 169 | 54 | 25 |
| 29 | 343 | 657 | 608 | 243 | 191 | 125 | 161 | 46 | 20 |
| 30 | 423 | 805 | 919 | 287 | 392 | 318 | 169 | 44 | 20 |
| 31 | 450 | 1090 | 1320 | 353 | 879 | 838 | -- | -- | -- |
| TOTAL | 7835 | -- | 11644 | 10558 | -- | 12140 | 6140 | -- | 3225 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 44691
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 49943.0

## 06089000 SUN RIVER NEAR VAUGHN, MONT.

LOCATION.--Lat 47°32'12", long 111°27'27", in SE¼NW¼NE¼ sec.34, T.21 N., R.2 E., Cascade County, at county bridge 1.8 miles downstream from gaging station, 4.4 miles southeast of Vaughn, 5.5 miles downstream from Muddy Creek, and 7.5 miles northwest of Great Falls.

DRAINAGE AREA.--1,854 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.
Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 573 mg/l Oct. 1-15; minimum, 169 mg/l June 1-16.
Hardness: Maximum, 330 mg/l Nov. 13-29, Dec. 1-20, Dec. 21-31; minimum, 130 mg/l June 1-16.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-15 | -- | 351 | -- | 5.3 | -- | 63 | 40 | 70 | 3.0 | 260 | 0 | 250 |
| 16-31 | -- | 378 | -- | 5.8 | -- | 60 | 37 | 63 | 2.4 | 275 | 0 | 210 |
| NOV. | | | | | | | | | | | | |
| 01-12 | -- | 392 | -- | 7.2 | -- | 60 | 42 | 49 | 2.3 | 263 | 0 | 190 |
| 13-29 | -- | 305 | -- | 6.9 | -- | 63 | 42 | 49 | 2.5 | 267 | 0 | 200 |
| DEC. | | | | | | | | | | | | |
| 01-20 | -- | 271 | -- | 7.1 | -- | 65 | 40 | 45 | 2.5 | 282 | 0 | 190 |
| 21-31 | -- | 238 | -- | 7.1 | -- | 71 | 38 | 37 | 1.9 | 289 | 0 | 160 |
| JAN. | | | | | | | | | | | | |
| 01-09 | -- | 258 | -- | 9.0 | 100 | 64 | 36 | 38 | 1.7 | 267 | 0 | 150 |
| 10-31 | -- | 301 | -- | 8.0 | 120 | 64 | 34 | 38 | 2.6 | 261 | 0 | 140 |
| FEB. | | | | | | | | | | | | |
| 01-13 | -- | 340 | -- | 7.2 | 10 | 58 | 36 | 31 | 2.2 | 236 | -- | 170 |
| 14-28 | -- | 323 | -- | 6.6 | 20 | 64 | 37 | 39 | 2.5 | 236 | -- | 190 |
| MAR. | | | | | | | | | | | | |
| 01-16 | -- | 295 | -- | 6.3 | 20 | 45 | 35 | 44 | 3.1 | 227 | -- | 170 |
| 17-31 | -- | 330 | -- | 5.7 | 20 | 49 | 40 | 53 | 2.7 | 245 | -- | 200 |
| APR. | | | | | | | | | | | | |
| 01-16 | -- | 368 | -- | -- | 10 | 55 | 38 | 43 | 1.8 | 218 | 0 | 190 |
| 17-30 | -- | 627 | -- | 6.4 | 20 | 51 | 29 | 29 | 2.6 | 225 | 0 | 120 |
| MAY | | | | | | | | | | | | |
| 01-11 | -- | 1810 | -- | 7.7 | 10 | 45 | 17 | 13 | 1.3 | 187 | 0 | 60 |
| 12-17 | -- | 4750 | -- | 8.1 | 10 | 39 | 12 | 7.4 | 1.3 | 172 | 0 | 30 |
| 18-31 | -- | 3830 | -- | 6.3 | 10 | 38 | 14 | 12 | 1.2 | 154 | 0 | 43 |
| JUNE | | | | | | | | | | | | |
| 01-16 | -- | 4430 | -- | 5.8 | 10 | 35 | 11 | 7.6 | 1.0 | 154 | 0 | 31 |
| 18-30 | -- | 1960 | -- | 5.3 | 10 | 37 | 14 | 12 | 1.2 | 171 | 0 | 44 |
| JULY | | | | | | | | | | | | |
| 01-14 | -- | 655 | -- | 5.1 | 10 | 50 | 30 | 32 | 2.1 | 243 | 0 | 130 |
| 15-31 | -- | 419 | -- | 7.2 | 10 | 59 | 43 | 50 | 2.9 | 293 | 0 | 190 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 560 | -- | 7.1 | 10 | 57 | 39 | 40 | 2.0 | 278 | 0 | 160 |
| SEP. | | | | | | | | | | | | |
| 02-30 | -- | 583 | -- | 5.2 | 0 | 55 | 39 | 43 | 2.1 | 266 | 0 | 170 |
| WTD. AVG. | -- | -- | -- | 6.7 | -- | 45 | 22 | 23 | 1.6 | 199 | 0 | 90 |
| TIME WTD. AVG. | -- | 886 | -- | 7.2 | -- | 55 | 34 | 39 | 2.2 | 244 | 0 | 154 |
| TONS PER DAY | -- | -- | -- | 16 | -- | 108 | 53 | 54 | 3.8 | 476 | 0 | 214 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN. | | | | | | | | | | | | |
| 07... | 1200 | 240 | .0 | 7.6 | 130 | 75 | 37 | 38 | 1.9 | 305 | 0 | 140 |
| MAR. | | | | | | | | | | | | |
| 31... | 1130 | 350 | 7.5 | 3.6 | 20 | 62 | 40 | 63 | 1.9 | 242 | -- | 230 |
| JULY | | | | | | | | | | | | |
| 07... | 1400 | 621 | 16.5 | 5.0 | 10 | 52 | 32 | 37 | 1.8 | 246 | 0 | 140 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 05... | 1710 | 363 | .010 | -- | -- |
| 26... | 1745 | 357 | .73 | -- | -- |
| DEC. | | | | | |
| 03... | 1710 | 270 | .020 | -- | -- |
| JAN., 1971 | | | | | |
| 07... | 1200 | 240 | .000 | 120 | 100 |
| FEB. | | | | | |
| 02... | 1400 | 330 | .000 | -- | -- |
| 26... | 1115 | 260 | .050 | -- | -- |

06089000 SUN RIVER NEAR VAUGHN, MONT.--Continued

EXTREMES, 1970-71.--Continued
Specific conductance: Maximum daily, 1,030 micromhos July 20; minimum daily, 258 micromhos June 10.
Water temperatures: Maximum, 26.5°C Aug. 11; minimum, freezing point on many days during November to March.

Period of record:
Dissolved solids: Maximum, 825 mg/l Apr. 29 to May 18, 1970; minimum, 169 mg/l June 1-16, 1971.
Hardness: Maximum, 430 mg/l Apr. 29 to May 18, 1970; minimum, 130 mg/l June 1-16, 1971.
Specific conductance: Maximum daily, 1,720 micromhos May 1, 1970; minimum daily, 214 micromhos June 8, 1970.
Water temperatures: Maximum observed, 28.0°C Aug. 11, 27, 1969; minimum, freezing point on many days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Hardness, 340 mg/l Jan. 7. The computations of tons per day of dissolved solids refer to flow past the gaging station. Stream frozen Nov. 21 to Mar. 11.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-15 | 9.4 | .5 | -- | -- | 573 | .80 | 559 | 320 | 110 | 1.7 | 847 | 7.9 |
| 16-31 | 5.6 | .5 | -- | -- | 516 | .72 | 542 | 300 | 76 | 1.6 | 785 | 8.0 |
| NOV. | | | | | | | | | | | | |
| 01-12 | 4.8 | .4 | -- | -- | 492 | .68 | 526 | 320 | 110 | 1.2 | 764 | 7.0 |
| 13-29 | 5.4 | .4 | -- | -- | 503 | .70 | 422 | 330 | 110 | 1.2 | 781 | 7.0 |
| DEC. | | | | | | | | | | | | |
| 01-20 | 4.6 | .3 | -- | -- | 496 | .67 | 362 | 330 | 95 | 1.1 | 749 | 7.9 |
| 21-31 | 3.8 | .3 | -- | -- | 466 | .64 | 300 | 330 | 95 | .9 | 701 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-09 | 3.0 | .5 | .20 | .05 | 440 | .60 | 307 | 310 | 91 | .9 | 689 | 8.5 |
| 10-31 | 5.0 | .5 | .20 | .00 | 420 | .57 | 341 | 300 | 86 | 1.0 | 690 | 8.3 |
| FEB. | | | | | | | | | | | | |
| 01-13 | 3.0 | .6 | .70 | .00 | 427 | .58 | 392 | 290 | 99 | .8 | 646 | 8.3 |
| 14-28 | 3.8 | .6 | .80 | .03 | 463 | .63 | 404 | 310 | 120 | 1.0 | 688 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-16 | 3.9 | .4 | .90 | .18 | 424 | .58 | 338 | 260 | 70 | 1.2 | 675 | 8.2 |
| 17-31 | 4.6 | .3 | .30 | .00 | 477 | .65 | 425 | 290 | 86 | 1.4 | 781 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01-16 | 4.5 | .3 | .40 | .00 | 462 | .63 | 459 | 290 | 110 | 1.1 | 716 | 8.2 |
| 17-30 | 2.7 | .3 | .02 | .25 | 352 | .48 | 596 | 250 | 62 | .8 | 582 | 7.6 |
| MAY | | | | | | | | | | | | |
| 01-11 | 1.4 | .2 | .04 | .06 | 238 | .32 | 1160 | 180 | 29 | .4 | 401 | 8.2 |
| 12-17 | .9 | .2 | .01 | .03 | 184 | .25 | 2360 | 150 | 6 | .3 | 317 | 8.2 |
| 18-31 | .9 | .2 | .01 | .00 | 191 | .26 | 1980 | 150 | 26 | .4 | 343 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 01-16 | 1.6 | .3 | .00 | .00 | 169 | .23 | 2020 | 130 | 6 | .3 | 280 | 7.6 |
| 18-30 | 1.8 | .4 | .00 | .00 | 200 | .27 | 1060 | 150 | 10 | .4 | 333 | 8.0 |
| JULY | | | | | | | | | | | | |
| 01-14 | 3.2 | .9 | .03 | .06 | 373 | .51 | 660 | 250 | 49 | .9 | 631 | 8.2 |
| 15-31 | 6.0 | .9 | .15 | .06 | 504 | .69 | 570 | 320 | 84 | 1.2 | 797 | 7.8 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 2.4 | .4 | .31 | .03 | 446 | .61 | 674 | 300 | 75 | 1.0 | 709 | 8.2 |
| SEP. | | | | | | | | | | | | |
| 02-30 | 3.3 | .5 | .28 | .09 | 450 | .61 | 708 | 300 | 80 | 1.1 | 722 | 8.1 |
| WTD. AVG. | 2.4 | .3 | -- | -- | 289 | .39 | -- | 203 | 41 | .6 | 471 | 8.0 |
| TIME WTD. AVG. | 3.8 | .4 | -- | -- | 416 | .57 | -- | 275 | 76 | .0 | 657 | 8.0 |
| TONS PER DAY | 5.7 | .8 | -- | -- | 692 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| JAN. | | | | | | | | | | | | |
| 07... | 3.3 | .5 | .00 | .00 | 460 | .63 | 298 | 340 | 90 | .9 | 683 | 8.1 |
| MAR. | | | | | | | | | | | | |
| 31... | 4.4 | .5 | .80 | .03 | 528 | .72 | 499 | 320 | 120 | 1.5 | 772 | 8.2 |
| JULY | | | | | | | | | | | | |
| 07... | 2.3 | .7 | .36 | .06 | 394 | .54 | 661 | 260 | 60 | 1.0 | 635 | 7.6 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| MAR. | | | | | |
| 31... | 1130 | 350 | .040 | 80 | 17 |
| APR. | | | | | |
| 30... | 1200 | 1630 | .070 | -- | -- |
| MAY | | | | | |
| 27... | 1600 | 4070 | .030 | -- | -- |
| JULY | | | | | |
| 07... | 1400 | 621 | .040 | 110 | 27 |
| 29... | 1115 | 635 | .020 | -- | -- |
| SEP. | | | | | |
| 09... | 1600 | 500 | .040 | -- | -- |

06089000 SUN RIVER NEAR VAUGHN, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 792 | 713 | 752 | 706 | 721 | 731 | 765 | 425 | 305 | 478 | 727 | --- |
| 2 | 736 | 761 | 733 | 736 | 704 | 762 | 714 | 381 | 310 | 482 | 727 | 699 |
| 3 | 794 | 735 | 769 | 753 | 721 | 369 | 825 | 382 | 268 | 571 | 739 | 665 |
| 4 | 935 | 793 | 713 | 733 | 682 | 647 | 759 | 387 | 313 | 627 | 726 | 665 |
| 5 | 700 | 775 | 685 | 792 | 727 | 728 | 755 | 426 | 291 | 601 | 741 | 632 |
| 6 | 768 | 720 | 714 | 859 | 706 | 693 | 759 | 413 | 291 | 571 | 746 | 701 |
| 7 | 809 | 787 | 765 | 751 | 659 | 726 | 721 | 444 | 297 | 667 | 693 | 704 |
| 8 | 792 | 758 | 769 | 586 | 659 | 685 | 753 | 295 | 294 | 637 | 726 | 694 |
| 9 | 915 | 739 | 730 | 715 | 678 | 669 | 652 | 406 | 316 | 631 | 675 | 665 |
| 10 | 965 | 739 | 733 | 689 | 616 | 633 | 718 | 478 | 258 | 644 | 722 | 736 |
| 11 | 965 | 773 | 744 | 694 | 643 | 605 | 389 | 372 | 265 | 674 | 686 | 736 |
| 12 | 1000 | 795 | 787 | 733 | 630 | 660 | 719 | 326 | 265 | 676 | 743 | 792 |
| 13 | 935 | 861 | 769 | 736 | 643 | 710 | 721 | 308 | 315 | 656 | 712 | 763 |
| 14 | 836 | 721 | 750 | 733 | 687 | 728 | 738 | 294 | 297 | 656 | 780 | 717 |
| 15 | 915 | 758 | 857 | 733 | 707 | 764 | 727 | 291 | 294 | 725 | 745 | 739 |
| 16 | 848 | 863 | 857 | 715 | 725 | 728 | 736 | 371 | 297 | 769 | 722 | 684 |
| 17 | 814 | 779 | 773 | 608 | 795 | 811 | 575 | 297 | --- | 765 | 726 | 679 |
| 18 | 794 | 758 | 718 | 674 | 725 | 742 | 550 | 365 | 319 | 712 | 686 | 803 |
| 19 | 753 | 797 | 822 | 638 | 767 | 786 | 667 | 506 | 363 | 812 | 717 | 754 |
| 20 | 790 | 741 | 857 | 733 | 734 | 728 | 636 | 388 | 413 | 1030 | 724 | 739 |
| 21 | 772 | 725 | 680 | 742 | 727 | 804 | 598 | 413 | 429 | 769 | 680 | 792 |
| 22 | 774 | 846 | 769 | 654 | 709 | 728 | 625 | 414 | 443 | 827 | 681 | 745 |
| 23 | 736 | 356 | 750 | 696 | 711 | 746 | 736 | 398 | 396 | 860 | 686 | 837 |
| 24 | 811 | 913 | 735 | 733 | 709 | 827 | 774 | 382 | 283 | 827 | 776 | 694 |
| 25 | --- | 866 | 750 | 733 | 725 | 728 | 839 | 336 | 272 | 845 | 686 | 745 |
| 26 | 818 | 756 | 728 | 718 | 658 | 742 | 636 | 368 | 294 | 827 | 701 | 756 |
| 27 | 776 | 977 | 713 | 699 | 699 | 808 | 740 | 317 | 357 | 791 | 696 | 717 |
| 28 | 792 | 756 | 728 | 733 | 723 | 764 | 536 | 288 | 346 | 791 | 743 | 687 |
| 29 | 774 | 730 | 714 | 683 | --- | 766 | 375 | 320 | 449 | 796 | 757 | 719 |
| 30 | 790 | --- | 714 | 663 | --- | 782 | 536 | 270 | 479 | 733 | 757 | 727 |
| 31 | 774 | --- | 716 | 733 | --- | 811 | --- | 316 | --- | 747 | 798 | --- |
| MONTH | 822 | 769 | 751 | 713 | 700 | 723 | 676 | 367 | 328 | 716 | 723 | 724 |
| YEAR | 668 | | | | | | | | | | | |

MISSOURI RIVER MAIN STEM

06090800 MISSOURI RIVER AT FORT BENTON, MONT.

LOCATION.--Lat 47°49'03", long 110°39'59", in SE¼SE¼ sec.23, T.24 N., R.8 E., Chouteau County, at gaging station at abandoned highway bridge at Fort Benton, 3.8 miles upstream from Shonkin Creek, and at mile 2,073.2.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 13... | 1600 | 8310 | 45 | 16 | 19 | 68 | 7.2 | .7 | .2 |
| NOV. | | | | | | | | | |
| 16... | 1230 | 7320 | 43 | 15 | -- | 57 | 8.4 | -- | .2 |
| DEC. | | | | | | | | | |
| 09... | 1145 | 7130 | 45 | 14 | -- | 54 | 7.4 | -- | .2 |
| JAN. | | | | | | | | | |
| 20... | 2020 | 9200 | 44 | 15 | 20 | 61 | 7.0 | .8 | -- |
| FEB. | | | | | | | | | |
| 09... | 1400 | 9200 | 43 | 12 | 18 | 36 | 7.0 | .9 | -- |
| MAR. | | | | | | | | | |
| 10... | 1450 | 8230 | 48 | 15 | -- | 59 | 3.3 | -- | -- |
| APR. | | | | | | | | | |
| 14... | 1400 | 11900 | 48 | 16 | 19 | 54 | 7.8 | 1.1 | -- |
| MAY | | | | | | | | | |
| 12... | 1330 | 22000 | 42 | 14 | -- | 43 | 8.3 | -- | -- |
| JUNE | | | | | | | | | |
| 08... | 1320 | 22600 | 39 | 13 | -- | 38 | 6.2 | -- | -- |
| JULY | | | | | | | | | |
| 07... | 1330 | 16700 | 38 | 12 | 17 | 41 | 7.8 | .6 | -- |
| AUG. | | | | | | | | | |
| 04... | 1730 | 8120 | 39 | 13 | -- | 54 | 10 | -- | -- |
| SEP. | | | | | | | | | |
| 08... | 1330 | 5820 | 43 | 14 | -- | 57 | 6.3 | -- | -- |

06089000 SUN RIVER NEAR VAUGHN, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 13.5 | 10.0 | 16.5 | 25.0 | --- |
| 2 | 14.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 14.5 | 11.5 | 17.0 | 22.0 | 18.5 |
| 3 | 16.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 15.0 | 13.0 | 16.5 | 22.0 | 19.5 |
| 4 | --- | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 14.0 | 12.5 | 15.0 | 25.5 | 18.0 |
| 5 | 10.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 | 13.5 | 13.0 | 15.0 | 21.5 | 15.0 |
| 6 | 7.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.0 | 9.0 | 11.5 | 17.5 | 24.5 | 15.0 |
| 7 | 7.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 | 12.0 | 10.5 | 17.5 | 25.0 | 15.0 |
| 8 | 8.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 12.0 | 10.0 | 17.5 | 25.0 | 15.0 |
| 9 | 7.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 10.5 | 13.5 | 18.0 | 25.5 | 18.0 |
| 10 | 8.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 12.0 | 14.0 | 18.0 | 25.0 | 15.0 |
| 11 | 9.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 14.5 | 13.5 | 19.0 | 26.5 | 13.0 |
| 12 | 8.0 | 1.0 | 0.0 | 0.0 | 0.0 | 2.0 | 5.0 | 15.0 | 10.5 | 20.0 | 25.0 | 13.0 |
| 13 | 7.5 | 1.0 | 0.0 | 0.0 | 0.0 | 2.0 | 9.5 | 11.5 | 15.5 | 22.0 | 25.5 | 12.0 |
| 14 | 10.0 | 1.0 | 0.0 | 0.0 | 0.0 | 2.5 | 12.5 | 9.5 | 15.0 | 23.5 | 19.0 | 12.0 |
| 15 | 9.5 | 1.0 | 0.0 | 0.0 | 0.0 | 2.5 | 11.0 | 10.0 | 13.5 | 22.5 | 20.5 | 11.0 |
| 16 | 10.0 | 1.5 | 0.0 | 0.0 | 0.0 | 3.0 | 11.5 | 13.5 | 14.5 | 20.0 | 18.5 | 10.0 |
| 17 | 12.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 6.5 | 7.0 | --- | 22.0 | 19.5 | 9.0 |
| 18 | 12.5 | 1.0 | 0.0 | 0.0 | 0.0 | 2.5 | 5.0 | 8.0 | 15.0 | 22.5 | 18.0 | 8.0 |
| 19 | 10.0 | 1.0 | 0.0 | 0.0 | 0.0 | 3.0 | 12.0 | 10.0 | 15.5 | 23.0 | 17.0 | 10.0 |
| 20 | 9.5 | 0.5 | 0.0 | 0.0 | 0.0 | 3.0 | 12.0 | 10.0 | 16.5 | 24.0 | 20.5 | 11.0 |
| 21 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 11.5 | 8.0 | 16.5 | 24.0 | 21.0 | 8.0 |
| 22 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 11.0 | 7.0 | 17.5 | 25.0 | 18.0 | 12.0 |
| 23 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 12.0 | 13.0 | 20.0 | 23.5 | 15.5 | 11.0 |
| 24 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 10.0 | 14.0 | 17.5 | 20.5 | 15.5 | 10.0 |
| 25 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 8.0 | 14.5 | 16.5 | 20.0 | 15.5 | 10.0 |
| 26 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 10.5 | 15.5 | 15.0 | 19.5 | 15.5 | 9.0 |
| 27 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 7.0 | 12.0 | 13.0 | 17.5 | 23.5 | 9.0 |
| 28 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 11.5 | 13.0 | 13.5 | 21.0 | 16.5 | 9.0 |
| 29 | 5.0 | 0.0 | 0.0 | 0.0 | --- | 6.0 | 12.0 | 11.5 | 12.0 | 23.0 | 16.5 | 8.0 |
| 30 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 4.5 | 14.0 | 10.0 | 15.5 | 24.0 | 18.0 | 8.5 |
| 31 | 4.0 | --- | 0.0 | 0.0 | --- | 5.5 | --- | 10.5 | --- | 24.5 | 16.5 | --- |
| MONTH | 8.5 | 1.5 | 0.0 | 0.0 | 0.0 | 2.0 | 9.5 | 11.5 | 14.0 | 20.5 | 20.5 | 12.0 |
| YEAR | 8.5 | | | | | | | | | | | |

MISSOURI RIVER MAIN STEM

06090800 MISSOURI RIVER AT FORT BENTON, MONT.--Continued

DRAINAGE AREA.--24,749 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. 13... | -- | 259 | .35 | 5810 | 180 | .04 | .12 | 1.6 |
| NOV. 16... | -- | 253 | .34 | 5000 | 170 | .24 | .090 | 1.0 |
| DEC. 09... | -- | 260 | .35 | 5010 | 170 | .06 | .060 | 1.5 |
| JAN. 20... | -- | 246 | .33 | 6110 | 170 | .00 | -- | 1.8 |
| FEB. 09... | .00 | -- | .30 | 5470 | 160 | -- | -- | 1.3 |
| MAR. 10... | .10 | 294 | .40 | 6530 | 180 | .09 | .10 | 1.2 |
| APR. 14... | .20 | 254 | .35 | 8160 | 190 | .25 | .11 | 2.0 |
| MAY 12... | .20 | 230 | -- | 13700 | 160 | .07 | .20 | 1.2 |
| JUNE 08... | .10 | 248 | .00 | 15100 | 150 | .08 | .20 | 1.1 |
| JULY 07... | .02 | 224 | .30 | 10100 | 140 | .20 | .11 | 1.4 |
| AUG. 04... | .06 | 228 | .31 | 5000 | 150 | .13 | .080 | 2.3 |
| SEP. 08... | .01 | 240 | .33 | 3770 | 160 | .10 | .10 | 1.3 |

06090800 MISSOURI RIVER AT FORT BENTON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 13... | 1600 | 8310 | 10 | 0 | 40 | 0 | 0 | 20 | .00 |
| JAN. | | | | | | | | | |
| 20... | 2020 | 9200 | -- | 0 | 70 | 0 | -- | 6 | .00 |
| FEB. | | | | | | | | | |
| 09... | 1400 | 9200 | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | |
| 14... | 1400 | 11900 | 0 | 0 | 90 | 1 | 0 | 42 | .00 |
| JULY | | | | | | | | | |
| 07... | 1330 | 16700 | 0 | 0 | 90 | 0 | 0 | 2 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 13... | 1600 | 8310 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 20... | 2020 | 9200 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 14... | 1400 | 11900 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 07... | 1330 | 16700 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 13... | 1600 | 9.5 | 9.5 | 410 | 9.6 | 7.9 | 170 |
| NOV. | | | | | | | |
| 16... | 1230 | 6.0 | 15.0 | 400 | 11.2 | -- | 750 |
| DEC. | | | | | | | |
| 09... | 1145 | .5 | -- | 395 | 13.2 | 8.2 | 140 |
| JAN. | | | | | | | |
| 20... | 2020 | .0 | -1.0 | 410 | 12.8 | 7.4 | 180 |
| FEB. | | | | | | | |
| 09... | 1400 | .0 | 9.0 | 310 | 12.6 | 8.2 | 3 |
| MAR. | | | | | | | |
| 10... | 1450 | 4.0 | 12.0 | 420 | 12.8 | 8.2 | 8 |
| APR. | | | | | | | |
| 14... | 1400 | 8.0 | 21.0 | 410 | 11.6 | 8.3 | 10 |
| MAY | | | | | | | |
| 12... | 1330 | 13.0 | 27.5 | 375 | 8.6 | 8.6 | 700 |
| JUNE | | | | | | | |
| 08... | 1320 | 15.0 | 23.5 | 350 | 9.4 | 8.2 | 590 |
| JULY | | | | | | | |
| 07... | 1330 | 16.5 | 19.5 | 355 | 10.2 | 7.7 | 590 |
| AUG. | | | | | | | |
| 04... | 1730 | 24.5 | 33.0 | 365 | 9.8 | 8.6 | 200 |
| SEP. | | | | | | | |
| 08... | 1330 | 18.5 | 29.5 | 380 | 10.4 | 8.4 | 95 |

MISSOURI RIVER MAIN STEM

06090800 MISSOURI RIVER AT FORT BENTON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. 13... | 0 | 23 | .0 | 11 | 6 | 0 | 0 | 20 |
| JAN. 20... | 1 | 0 | .0 | 2 | 0 | -- | 1 | 30 |
| FEB. 09... | -- | 100 | -- | -- | -- | -- | -- | -- |
| APR. 14... | 6 | 20 | .1 | 3 | 21 | 0 | 1 | 80 |
| JULY 07... | 0 | 140 | .1 | 20 | 0 | 0 | 0 | 7 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. 13... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 20... | .00 | .00 | .00 | .00 | .00 | .00 | .04 | .00 | .00 |
| APR. 14... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY 07... | .00 | .00 | -- | -- | -- | -- | .00 | .00 | .00 |

## 06101500 MARIAS RIVER NEAR CHESTER, MONT.

LOCATION.--Lat 48°19'09", long 111°05'39", in NW¼NW¼ sec.33, T.30 N., R.5 E., Liberty County, at Tiber Dam outlet, 1.7 miles upstream from gaging station, 6 miles upstream from Pondera Coulee, and 15 miles southwest of Chester.

DRAINAGE AREA.--4,927 sq mi upstream from gaging station, of which 518 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: August 1964 to September 1971.
Water temperatures: October 1964 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 410 mg/l Jan. 1-31; minimum, 264 mg/l July 1-30.
Hardness: Maximum, 270 mg/l Jan. 1-31; minimum, 170 mg/l July 1-30.
Specific conductance: Maximum daily, 678 micromhos Jan. 26; minimum daily, 418 micromhos Aug. 7-9.
Water temperatures: Maximum, 21.5°C Aug. 11-13; minimum, 2.0°C on several days during January.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 1280 | -- | 4.4 | -- | 54 | 20 | 28 | 2.3 | 172 | 0 | 130 |
| NOV. | | | | | | | | | | | | |
| 02-30 | -- | 605 | -- | 5.5 | -- | 50 | 21 | 30 | 2.4 | 174 | 0 | 130 |
| DEC. | | | | | | | | | | | | |
| 01-22 | -- | 557 | -- | 3.9 | -- | 50 | 23 | 31 | 2.2 | 176 | 0 | 140 |
| 23-31 | -- | 304 | -- | 3.7 | -- | 58 | 28 | 36 | 2.3 | 207 | 0 | 160 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 228 | -- | 7.0 | 100 | 63 | 28 | 38 | 2.3 | 202 | 6 | 160 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 786 | -- | 3.6 | 10 | 57 | 26 | 12 | 2.4 | 211 | -- | 110 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 806 | -- | 4.8 | 40 | 59 | 27 | 38 | 2.8 | 209 | -- | 160 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 991 | -- | 2.5 | 20 | 55 | 24 | 31 | 2.3 | 181 | 0 | 150 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 1950 | -- | 3.9 | 10 | -- | 23 | 31 | 2.2 | 177 | 0 | -- |
| JUNE | | | | | | | | | | | | |
| 01-14 | -- | 3190 | -- | 4.2 | 10 | 47 | 20 | 29 | 2.1 | 177 | 0 | 120 |
| 15-30 | -- | 1910 | -- | 4.2 | 10 | 46 | 19 | 29 | 1.9 | 172 | 0 | 120 |
| JULY | | | | | | | | | | | | |
| 01-30 | -- | 1460 | -- | 3.7 | 10 | 41 | 17 | 22 | 1.7 | 159 | 0 | 97 |
| AUG. | | | | | | | | | | | | |
| 02-31 | -- | 1390 | -- | 3.9 | 10 | 45 | 18 | 24 | 1.3 | 161 | 0 | 110 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 948 | -- | 3.9 | 10 | 45 | 19 | 25 | 1.7 | 162 | 0 | 110 |
| WTD. AVG. | -- | -- | -- | 4.0 | -- | 49 | 21 | 28 | 2.1 | 176 | 0 | 123 |
| TIME WTD. AVG. | -- | 1120 | -- | 4.3 | -- | 52 | 22 | 29 | 2.1 | 181 | 1 | 130 |
| TONS PER DAY | -- | -- | -- | 12 | -- | 139 | 64 | 84 | 6.2 | 533 | 0 | 347 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 08... | 1100 | 632 | 2.5 | 4.0 | 10 | 52 | 22 | 31 | 2.3 | 186 | 0 | 130 |
| APR., 1971 | | | | | | | | | | | | |
| 02... | 1030 | 680 | 2.5 | 3.9 | 20 | 62 | 26 | 37 | 2.4 | 204 | -- | 170 |
| JUNE | | | | | | | | | | | | |
| 30... | 1045 | 1490 | 16.5 | 3.2 | 20 | 42 | 17 | 24 | 1.6 | 166 | 3 | 97 |

06101500 MARIAS RIVER NEAR CHESTER, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 511 mg/l Apr. 21-30, 1965; minimum, 264 mg/l July 1-30, 1971.
Hardness: Maximum, 296 mg/l Feb. 1-28, 1967; minimum, 170 mg/l July 1-30, 1971.
Specific conductance: Maximum daily, 752 micromhos Apr. 29, 1965, Apr. 22, 23, 1970; minimum daily, 418 micromhos Aug. 7-9, 1971.
Water temperatures: Maximum, 21.5°C Aug. 11-13, 1971; minimum observed, 1.5°C on several days in 1966.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 2.6 | .2 | -- | -- | 323 | .44 | 1130 | 220 | 76 | .8 | 514 | 7.9 |
| NOV. | | | | | | | | | | | | |
| 02-30 | 3.0 | .5 | -- | -- | 331 | .49 | 588 | 210 | 69 | .9 | 550 | 7.9 |
| DEC. | | | | | | | | | | | | |
| 01-22 | 3.4 | .1 | -- | -- | 340 | .46 | 510 | 220 | 76 | .9 | 544 | 8.0 |
| 23-31 | 4.4 | .2 | -- | -- | 398 | .54 | 328 | 260 | 89 | 1.0 | 617 | 8.3 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 4.2 | .4 | .20 | .00 | 410 | .56 | 252 | 270 | 94 | 1.0 | 635 | 8.4 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 3.7 | .5 | .20 | .00 | 320 | .44 | 679 | 250 | 76 | .3 | 608 | 8.2 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 4.0 | .2 | .10 | .00 | 399 | .54 | 868 | 260 | 87 | 1.0 | 463 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01-30 | 12 | .2 | .22 | .00 | 367 | .50 | 982 | 240 | 88 | .9 | 584 | 8.2 |
| MAY | | | | | | | | | | | | |
| 01-31 | 3.1 | .2 | .13 | .03 | 296 | .40 | 1560 | -- | -- | .6 | 861 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 01-14 | 2.8 | .2 | .17 | .00 | 313 | .43 | 2700 | 200 | 54 | .9 | 519 | 7.9 |
| 15-30 | 2.6 | .5 | .06 | .03 | 308 | .42 | 1590 | 190 | 52 | .9 | 502 | 7.9 |
| JULY | | | | | | | | | | | | |
| 01-30 | 2.5 | .4 | .00 | .00 | 264 | .36 | 1040 | 170 | 42 | .7 | 432 | 8.1 |
| AUG. | | | | | | | | | | | | |
| 02-31 | 1.8 | .1 | .04 | .03 | 283 | .38 | 1060 | 190 | 54 | .8 | 466 | 8.1 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 3.6 | .3 | .06 | .03 | 288 | .39 | 737 | 190 | 58 | .8 | 463 | 8.2 |
| WTD. AVG. | 3.6 | .3 | -- | -- | 314 | .43 | -- | 210 | 65 | .8 | 560 | 8.1 |
| TIME WTD. AVG. | 3.9 | .3 | -- | -- | 329 | .45 | -- | 221 | 71 | .8 | 555 | 8.1 |
| TONS PER DAY | 11 | .8 | -- | -- | 951 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 08... | 3.8 | .2 | -- | -- | 340 | .47 | 585 | 220 | 65 | .9 | 526 | 6.8 |
| APR., 1971 | | | | | | | | | | | | |
| 02... | 3.4 | .8 | .30 | .06 | 407 | .55 | 747 | 260 | 94 | 1.0 | 587 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 30... | 2.9 | .2 | .15 | .03 | 273 | .37 | 1100 | 170 | 34 | .8 | 453 | 8.5 |

06101500 MARIAS RIVER NEAR CHESTER, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 02... | 1200 | 1290 | .020 | -- | -- |
| NOV. | | | | | |
| 03... | 0950 | 578 | .010 | -- | -- |
| DEC. | | | | | |
| 08... | 1100 | 632 | .000 | 30 | -- |
| JAN., 1971 | | | | | |
| 05... | 1000 | 264 | .000 | -- | -- |
| FEB. | | | | | |
| 16... | 1100 | 723 | .000 | -- | -- |
| APR. | | | | | |
| 02... | 1030 | 680 | .040 | 50 | 0 |
| 27... | 1000 | 1340 | .090 | -- | -- |
| MAY | | | | | |
| 25... | 1045 | 2460 | .020 | -- | -- |
| JUNE | | | | | |
| 30... | 1045 | 1490 | .020 | 40 | 0 |
| JULY | | | | | |
| 28... | 1345 | 1450 | .010 | -- | -- |
| AUG. | | | | | |
| 24... | 1415 | 1360 | .040 | -- | -- |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 501 | --- | 531 | 623 | 660 | 614 | 635 | 577 | 530 | 458 | 421 | 483 |
| 2 | 508 | 518 | 533 | 626 | 661 | 623 | 632 | 571 | 534 | 454 | 424 | 477 |
| 3 | 510 | 514 | 564 | 624 | 660 | 614 | 631 | 571 | 519 | 461 | 424 | 479 |
| 4 | 508 | 533 | 529 | 624 | 647 | 615 | 621 | 571 | 520 | 458 | 422 | 481 |
| 5 | 507 | 514 | 527 | 623 | 653 | 614 | 629 | 571 | 512 | 455 | 424 | 466 |
| 6 | 507 | 531 | 525 | 653 | 633 | 614 | 643 | 571 | 511 | 459 | 424 | 479 |
| 7 | 501 | 522 | 533 | 632 | 657 | 613 | 635 | 578 | 497 | 450 | 418 | 472 |
| 8 | 504 | 522 | 529 | 638 | 657 | 613 | 617 | 574 | 547 | 436 | 418 | 472 |
| 9 | 504 | 518 | 527 | 628 | 659 | 614 | 619 | 569 | 491 | 440 | 418 | 461 |
| 10 | 504 | 515 | 522 | 632 | 647 | 623 | 558 | 569 | 489 | 440 | 419 | 475 |
| 11 | 504 | 522 | 521 | 638 | 653 | 623 | 558 | 571 | 489 | 443 | 419 | 468 |
| 12 | 507 | 522 | 527 | 638 | 648 | 615 | 572 | 579 | 487 | 440 | 421 | 467 |
| 13 | 509 | 530 | 536 | 641 | 633 | 613 | 582 | 571 | 487 | 427 | 425 | 468 |
| 14 | 507 | 523 | 538 | 639 | 653 | 619 | 572 | 574 | 537 | 427 | 443 | 466 |
| 15 | 507 | 522 | 537 | 638 | 657 | 614 | 569 | 570 | 487 | 432 | 466 | 453 |
| 16 | 509 | 560 | 538 | 639 | 648 | 614 | 569 | 570 | 480 | 432 | 498 | 453 |
| 17 | 510 | 522 | 548 | 641 | 635 | 619 | 569 | 571 | 489 | --- | 483 | 450 |
| 18 | 510 | 527 | 556 | 642 | 643 | 619 | 571 | 571 | 496 | 429 | 498 | 467 |
| 19 | 507 | 527 | 574 | 661 | 643 | 613 | 573 | 580 | 496 | 426 | 488 | 467 |
| 20 | 509 | 531 | 576 | 653 | 635 | 614 | 572 | 571 | 488 | 426 | 488 | 468 |
| 21 | 509 | 530 | 575 | 653 | 632 | 614 | 573 | 569 | 534 | 429 | 493 | 453 |
| 22 | 511 | 527 | 577 | 653 | 633 | 613 | 571 | 568 | 519 | 429 | 486 | 467 |
| 23 | 509 | 527 | 619 | 661 | 632 | 611 | 569 | 556 | 520 | 429 | 469 | 453 |
| 24 | 509 | 549 | 628 | 656 | 632 | 613 | 581 | 556 | 516 | 429 | 490 | 460 |
| 25 | 508 | 536 | 637 | 656 | 635 | 623 | 583 | 559 | 524 | 426 | 478 | 460 |
| 26 | 511 | 533 | 625 | 687 | 632 | 626 | 581 | 558 | 505 | 426 | 483 | 467 |
| 27 | 511 | 533 | 621 | 661 | 625 | 614 | 583 | 566 | 505 | 420 | 484 | 460 |
| 28 | 514 | 532 | 621 | 667 | 625 | 614 | 577 | 546 | 505 | 425 | 483 | 460 |
| 29 | 514 | 530 | 625 | 665 | --- | 625 | 577 | 532 | 446 | 426 | 478 | 468 |
| 30 | 514 | 531 | 630 | 665 | --- | 625 | 582 | 552 | 453 | 426 | 490 | 454 |
| 31 | 514 | --- | 632 | 656 | --- | 614 | --- | 560 | --- | 423 | 476 | --- |
| MONTH | 508 | 528 | 566 | 646 | 644 | 617 | 590 | 567 | 504 | 436 | 456 | 466 |
| YEAR | 544 | | | | | | | | | | | |

06101500 MARIAS RIVER NEAR CHESTER, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.0 | --- | 4.5 | 2.5 | 3.0 | 3.0 | 3.5 | 5.0 | 10.0 | 16.0 | 19.5 | 12.5 |
| 2 | 12.0 | 9.0 | 4.5 | 2.5 | 3.0 | 3.0 | 3.5 | 5.5 | 10.0 | 16.0 | 19.0 | 12.5 |
| 3 | 12.0 | 9.0 | 4.0 | 2.5 | 3.0 | 3.0 | 3.5 | 5.5 | 10.0 | 16.0 | 19.5 | 13.0 |
| 4 | 12.0 | 8.5 | 4.0 | 2.5 | 3.0 | 3.0 | 3.5 | 6.0 | 10.0 | 16.0 | 20.0 | 12.5 |
| 5 | 12.0 | 8.0 | 4.0 | 2.5 | 3.0 | 3.0 | 3.5 | 6.0 | 10.0 | 16.0 | 19.0 | 12.5 |
| 6 | 12.0 | 8.0 | 4.0 | 2.5 | 3.0 | 3.0 | 3.5 | 6.0 | 10.0 | 16.5 | 19.5 | 13.0 |
| 7 | 12.0 | 8.0 | 4.0 | 2.0 | 3.0 | 3.0 | 3.5 | 6.0 | 10.0 | 16.5 | 20.0 | 13.0 |
| 8 | 12.0 | 8.0 | 4.0 | 2.0 | 3.0 | 3.0 | 3.5 | 6.0 | 10.0 | 16.5 | 20.0 | 13.0 |
| 9 | 12.0 | 8.0 | 4.0 | 2.0 | 3.0 | 3.0 | 3.5 | 6.5 | 10.0 | 16.5 | 20.0 | 13.0 |
| 10 | 12.0 | 8.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 6.5 | 10.0 | 16.5 | 21.0 | 13.0 |
| 11 | 12.0 | 8.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 7.0 | 10.0 | 16.5 | 21.5 | 13.0 |
| 12 | 12.0 | 7.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 7.0 | 10.0 | 16.5 | 21.5 | 13.0 |
| 13 | 12.0 | 7.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 8.0 | 10.0 | 16.5 | 21.5 | 13.5 |
| 14 | 12.0 | 7.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 8.0 | 10.0 | 16.5 | 19.0 | 13.5 |
| 15 | 11.5 | 7.0 | 3.5 | 2.0 | 3.0 | 3.0 | 3.5 | 8.0 | 10.0 | 17.0 | 16.5 | 13.5 |
| 16 | 11.5 | 7.0 | 3.0 | 2.0 | 3.0 | 3.0 | 3.5 | 8.0 | 10.0 | 17.0 | 12.0 | 13.0 |
| 17 | 11.5 | 7.0 | 3.0 | 2.0 | 3.0 | 3.0 | 3.5 | 8.0 | 10.0 | 19.0 | 12.5 | 13.0 |
| 18 | 11.5 | 7.0 | 3.0 | 2.5 | 3.0 | 3.0 | 3.5 | 9.0 | 10.0 | 19.0 | 12.0 | 13.0 |
| 19 | 11.0 | 7.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.5 | 9.5 | 10.0 | 19.0 | 12.0 | 13.0 |
| 20 | 11.0 | 7.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.5 | 9.5 | 10.0 | 19.0 | 12.0 | 13.0 |
| 21 | 11.0 | 6.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.5 | 9.5 | 10.5 | 19.5 | 12.0 | 13.0 |
| 22 | 11.0 | 6.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.5 | 9.5 | 10.5 | 20.0 | 12.0 | 13.0 |
| 23 | 11.0 | 6.0 | 2.5 | 3.0 | 3.0 | 3.0 | 4.5 | 9.5 | 10.5 | 20.0 | 13.0 | 13.0 |
| 24 | 11.0 | 6.0 | 2.5 | 3.0 | 3.0 | 3.0 | 5.0 | 9.5 | 10.5 | 20.0 | 12.0 | 13.0 |
| 25 | 11.0 | 6.0 | 2.5 | 3.0 | 3.0 | 3.0 | 5.0 | 10.0 | 10.5 | 20.0 | 12.0 | 13.0 |
| 26 | 10.5 | 6.0 | 2.5 | 3.0 | 3.0 | 3.0 | 5.0 | 10.0 | 11.5 | 19.5 | 12.0 | 13.0 |
| 27 | 10.5 | 5.0 | 2.5 | 3.0 | 3.0 | 3.0 | 5.0 | 10.0 | 11.5 | 19.5 | 13.0 | 13.0 |
| 28 | 10.5 | 5.0 | 2.5 | 3.0 | 3.0 | 3.0 | 5.0 | 10.0 | 11.5 | 19.0 | 13.0 | 13.0 |
| 29 | 10.5 | 5.0 | 2.5 | 3.0 | --- | 3.5 | 5.0 | 10.0 | 15.0 | 19.0 | 13.0 | 13.0 |
| 30 | 10.5 | 5.0 | 2.5 | 3.0 | --- | 3.5 | 5.0 | 10.0 | 15.0 | 19.0 | 12.5 | 13.0 |
| 31 | 10.5 | --- | 2.5 | 3.0 | --- | 3.5 | --- | 10.0 | --- | 19.5 | 12.5 | --- |
| MONTH | 11.5 | 7.0 | 3.5 | 2.5 | 3.0 | 3.0 | 4.0 | 8.0 | 10.5 | 18.0 | 16.0 | 13.0 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06140500 MILK RIVER AT HAVRE, MONT.

LOCATION.--Lat 48°33'23", long 109°40'14", in NE¼SE¼SE¼ sec.5, T.32 N., R.16 E., Hill County, at gaging station at highway bridge on 7th Avenue East in Havre, 30 ft downstream from Bullhook Creek, 9.4 miles downstream from Big Sandy Creek, and 17 miles downstream from Fresno Dam.

DRAINAGE AREA.--5,844 sq mi, of which 670 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: August 1964 to September 1971.
Water temperatures: October 1964 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 328 mg/l Apr. 1-13; minimum, 145 mg/l Aug. 11-31.
Hardness: Maximum, 160 mg/l Nov. 16-30, Apr. 1-13; minimum, 79 mg/l Feb. 14-20.
Specific conductance: Maximum daily, 621 micromhos Apr. 5; minimum daily, 208 micromhos Feb. 16.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-13 | -- | 87 | -- | 6.0 | -- | 28 | 12 | 30 | 2.8 | 170 | 0 | 46 |
| 14-31 | -- | 76 | -- | 5.4 | -- | 31 | 15 | 46 | 4.1 | 202 | 0 | 65 |
| NOV. | | | | | | | | | | | | |
| 01-15 | -- | 70 | -- | 5.2 | -- | 32 | 15 | 40 | 4.1 | 198 | 0 | 62 |
| 16-30 | -- | 57 | -- | 5.9 | -- | 38 | 16 | 48 | 4.1 | 215 | 0 | 71 |
| DEC. | | | | | | | | | | | | |
| 01-08 | -- | 57 | -- | 5.4 | -- | 36 | 15 | 39 | 3.4 | 206 | 0 | 63 |
| 09-31 | -- | 52 | -- | 5.4 | -- | 34 | 16 | 44 | 3.3 | 218 | 0 | 68 |
| JAN. | | | | | | | | | | | | |
| 01-20 | -- | 72 | -- | 6.0 | 100 | 37 | 15 | 41 | 3.0 | 214 | 0 | 43 |
| 21-31 | -- | 118 | -- | 8.0 | 140 | 34 | 15 | 37 | 6.0 | 206 | 0 | 34 |
| FEB. | | | | | | | | | | | | |
| 01-13 | -- | 88 | -- | 7.2 | 20 | 33 | 16 | 36 | 4.5 | 212 | -- | 57 |
| 14-20 | -- | 736 | -- | 6.7 | 140 | 19 | 7.8 | 18 | 6.6 | 121 | -- | 25 |
| 21-28 | -- | 138 | -- | 8.6 | 80 | 27 | 13 | 35 | 6.3 | 191 | -- | 50 |
| MAR. | | | | | | | | | | | | |
| 01-18 | -- | 202 | -- | 9.1 | 100 | 30 | 14 | 44 | 7.0 | 192 | -- | 66 |
| 19-31 | -- | 195 | -- | 8.9 | 90 | 28 | 13 | 53 | 7.0 | 177 | -- | 83 |
| APR. | | | | | | | | | | | | |
| 01-13 | -- | 191 | -- | 12 | 50 | 35 | 17 | 52 | 7.4 | 232 | 0 | 85 |
| 14-30 | -- | 259 | -- | 4.5 | 30 | 32 | 14 | 40 | 4.8 | 191 | 0 | 57 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 977 | -- | 5.0 | 20 | 28 | 12 | 32 | 3.4 | 180 | 0 | 48 |
| JUNE | | | | | | | | | | | | |
| 01-30 | -- | 995 | -- | 5.8 | 10 | 32 | 14 | 35 | 3.2 | 239 | 0 | 57 |
| JULY | | | | | | | | | | | | |
| 01-15 | -- | 1030 | -- | 5.4 | 0 | 34 | 15 | 38 | 3.3 | 211 | 0 | 57 |
| 16-31 | -- | 1200 | -- | 5.2 | 0 | 30 | 13 | 26 | 3.3 | 180 | 0 | 41 |
| AUG. | | | | | | | | | | | | |
| 01-10 | -- | 1140 | -- | 4.8 | 10 | 26 | 11 | 15 | 1.9 | 129 | 0 | 28 |
| 11-31 | -- | 1010 | -- | 4.4 | 10 | 25 | 9.8 | 9.4 | 1.6 | 130 | 0 | 28 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 415 | -- | 3.5 | 0 | 25 | 9.7 | 14 | 1.6 | 131 | 0 | 33 |
| WTD. AVG. | -- | -- | -- | 5.4 | -- | 29 | 12 | 28 | 3.3 | 181 | 0 | 46 |
| TIME WTD. AVG. | -- | 463 | -- | 6.0 | -- | 31 | 13 | 35 | 3.9 | 189 | 0 | 53 |
| TONS PER DAY | -- | -- | -- | 6.7 | -- | 36 | 16 | 35 | 4.1 | 226 | 0 | 58 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 07... | 1510 | 58 | .0 | 5.6 | 20 | 38 | 16 | 43 | 3.2 | 224 | 0 | 65 |
| APR., 1971 | | | | | | | | | | | | |
| 01... | 1730 | 207 | 5.0 | 11 | 400 | 27 | 14 | 45 | 6.4 | 195 | -- | 71 |
| JUNE | | | | | | | | | | | | |
| 29... | 1815 | 847 | 17.5 | 5.4 | 50 | 38 | 14 | 36 | 3.1 | 204 | 0 | 59 |

06140500 MILK RIVER AT HAVRE, MONT.--Continued

EXTREMES, 1970-71.--Continued
Water temperatures: Maximum, 25.0°C Aug. 10-12; minimum, freezing point on many days during November to March.

Period of record:
Dissolved solids: Maximum, 486 mg/l Jan. 1-10, 1966; minimum, 145 mg/l Aug. 11-31, 1971.
Hardness: Maximum, 254 mg/l Jan. 1-10, 1966; minimum, 101 mg/l Sept. 1-30, 1970.
Specific conductance: Maximum daily, 795 micromhos Jan. 4, 28, 1966; minimum daily, 208 micromhos Feb. 16, 1971.
Water temperatures: Maximum observed, 25.5°C on several days during 1965-67; minimum, freezing point on many days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-13 | 4.7 | .1 | -- | -- | 214 | .29 | 50.0 | 120 | 0 | 1.2 | 361 | 8.0 |
| 14-31 | 8.5 | .1 | -- | -- | 275 | .38 | 57.7 | 140 | 0 | 1.7 | 456 | 8.0 |
| NOV. | | | | | | | | | | | | |
| 01-15 | 7.6 | .2 | -- | -- | 263 | .36 | 50.5 | 140 | 0 | 1.5 | 451 | 6.9 |
| 16-30 | 8.6 | .2 | -- | -- | 297 | .40 | 45.7 | 160 | 0 | 1.7 | 491 | 7.0 |
| DEC. | | | | | | | | | | | | |
| 01-08 | 6.0 | .2 | -- | -- | 269 | .36 | 41.2 | 150 | 0 | 1.4 | 449 | 8.2 |
| 09-31 | 5.8 | .1 | -- | -- | 284 | .38 | 39.7 | 150 | 0 | 1.6 | 475 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-20 | 8.0 | .3 | .10 | .20 | 260 | .35 | 50.5 | 150 | 0 | 1.4 | 452 | 8.1 |
| 21-31 | 4.5 | .3 | .10 | .00 | 240 | .33 | 76.5 | 150 | 0 | 1.3 | 422 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 01-13 | 5.2 | .4 | .10 | .03 | 264 | .36 | 62.7 | 150 | 0 | 1.3 | 414 | 8.1 |
| 14-20 | 2.2 | .7 | .10 | .31 | 147 | .20 | 292 | 79 | 0 | .9 | 236 | 8.1 |
| 21-28 | 3.7 | .3 | .10 | .25 | 239 | .33 | 89.1 | 120 | 0 | 1.4 | 381 | 8.1 |
| MAR. | | | | | | | | | | | | |
| 01-18 | 5.8 | .2 | .10 | .03 | 271 | .37 | 148 | 130 | 0 | 1.7 | 447 | 8.2 |
| 19-31 | 7.1 | .2 | .10 | .00 | 288 | .39 | 152 | 120 | 0 | 2.1 | 486 | 8.0 |
| APR. | | | | | | | | | | | | |
| 01-13 | 5.4 | .2 | .00 | .12 | 328 | .45 | 169 | 160 | 0 | 1.8 | 534 | 8.0 |
| 14-30 | 3.5 | .2 | .01 | .03 | 250 | .34 | 175 | 140 | 0 | 1.5 | 434 | 8.1 |
| MAY | | | | | | | | | | | | |
| 01-31 | 2.4 | .1 | .09 | .00 | 220 | .30 | 580 | 120 | 0 | 1.3 | 381 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 01-30 | 2.5 | .3 | .10 | .03 | 268 | .36 | 720 | 140 | 0 | 1.3 | 411 | 7.9 |
| JULY | | | | | | | | | | | | |
| 01-15 | 2.7 | .6 | .02 | .00 | 260 | .35 | 723 | 150 | 0 | 1.4 | 436 | 8.1 |
| 16-31 | 2.1 | .6 | .03 | .00 | 210 | .29 | 680 | 130 | 0 | 1.0 | 353 | 8.2 |
| AUG. | | | | | | | | | | | | |
| 01-10 | .8 | .0 | .06 | .00 | 151 | .21 | 465 | 110 | 4 | .6 | 285 | 8.0 |
| 11-31 | 1.0 | .4 | .29 | .03 | 145 | .20 | 395 | 100 | 0 | .4 | 243 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 3.4 | .2 | .22 | .03 | 156 | .21 | 175 | 100 | 0 | .6 | 255 | 8.0 |
| WTD. AVG. | 2.7 | .3 | -- | -- | 217 | .30 | -- | 124 | 0 | 1.1 | 361 | 8.1 |
| TIME WTD. AVG. | 4.5 | .3 | -- | -- | 240 | .33 | -- | 132 | 0 | 1.3 | 400 | 8.0 |
| TONS PER DAY | 3.3 | .4 | -- | -- | 271 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 07... | 5.8 | .1 | -- | -- | 287 | .39 | 44.8 | 160 | 0 | 1.5 | 462 | 6.9 |
| APR., 1971 | | | | | | | | | | | | |
| 01... | 5.2 | .5 | .20 | .31 | 278 | .38 | 155 | 130 | 0 | 1.8 | 434 | 7.9 |
| JUNE | | | | | | | | | | | | |
| 29... | 2.4 | .2 | .18 | .03 | 259 | .35 | 592 | 150 | 0 | 1.3 | 419 | 8.5 |

06140500 MILK RIVER AT HAVRE, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 01... | 1745 | 141 | .030 | -- | -- |
| NOV. | | | | | |
| 02... | 1645 | 73 | .010 | -- | -- |
| DEC. | | | | | |
| 07... | 1510 | 58 | .000 | 60 | -- |
| JAN., 1971 | | | | | |
| 04... | 1700 | 54 | .010 | -- | -- |
| FEB. | | | | | |
| 16... | 0810 | 800 | .14 | -- | -- |
| APR. | | | | | |
| 01... | 1730 | 207 | .12 | 100 | 49 |
| 26... | 1730 | 310 | .11 | -- | -- |
| MAY | | | | | |
| 24... | 2015 | 1190 | .040 | -- | -- |
| JUNE | | | | | |
| 29... | 1815 | 847 | .030 | 60 | 0 |
| JULY | | | | | |
| 29... | 0815 | 1150 | .010 | -- | -- |
| AUG. | | | | | |
| 24... | 1830 | 1150 | .040 | -- | -- |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 319 | 440 | 432 | 467 | 271 | 452 | 471 | 389 | 399 | 434 | 268 | 234 |
| 2 | 322 | 442 | 445 | 466 | 428 | 466 | 475 | 376 | 402 | 434 | 268 | 234 |
| 3 | 329 | 445 | 459 | 476 | 424 | 467 | 560 | 378 | 407 | 434 | 275 | 233 |
| 4 | 394 | 427 | 463 | 488 | 447 | 468 | 619 | 379 | 404 | 438 | 282 | 264 |
| 5 | 389 | 446 | 475 | 483 | 480 | 461 | 621 | 378 | 402 | 440 | 282 | 266 |
| 6 | 389 | 432 | 452 | 489 | 454 | 439 | 463 | 377 | 404 | 440 | 285 | 287 |
| 7 | 384 | 433 | 467 | 469 | 441 | 519 | 485 | 384 | 406 | 447 | 290 | 246 |
| 8 | 381 | 432 | 454 | 460 | 452 | 523 | 528 | 381 | 404 | 445 | 243 | 290 |
| 9 | 384 | 426 | 467 | 444 | 459 | 518 | 530 | 373 | 401 | 436 | 313 | 269 |
| 10 | 376 | 430 | 467 | 442 | 446 | 502 | 585 | 374 | 418 | 433 | 266 | 269 |
| 11 | 377 | 440 | 484 | 434 | 452 | 468 | 593 | 373 | 390 | 431 | 247 | 266 |
| 12 | 385 | 415 | 480 | 435 | 421 | 468 | 521 | 371 | 394 | 425 | 253 | 269 |
| 13 | 384 | 456 | 474 | 444 | 421 | 408 | 572 | 378 | 396 | 425 | 247 | 269 |
| 14 | 403 | 456 | 475 | 442 | 219 | 404 | 463 | 378 | 397 | 418 | 243 | 266 |
| 15 | 427 | 453 | 497 | 440 | 212 | 391 | 463 | 381 | 400 | 414 | 245 | 269 |
| 16 | 427 | 495 | 498 | 440 | 208 | 363 | 463 | 373 | 401 | 390 | 234 | 244 |
| 17 | 479 | 481 | 498 | 440 | 248 | 382 | 457 | 372 | 401 | 393 | 239 | 246 |
| 18 | --- | 489 | 490 | 440 | 281 | 386 | 460 | 373 | 408 | 390 | 239 | 246 |
| 19 | 600 | 501 | 517 | 446 | 268 | 403 | 458 | 376 | 407 | 379 | 247 | 244 |
| 20 | 489 | 493 | 467 | 467 | 295 | 407 | 432 | 369 | 409 | 378 | 234 | 244 |
| 21 | 468 | 479 | 467 | 411 | 355 | 523 | 456 | 369 | 411 | 377 | 241 | 244 |
| 22 | 446 | 488 | 490 | 322 | 336 | 475 | 429 | 371 | 418 | 370 | 239 | 246 |
| 23 | 427 | 505 | 475 | 382 | 407 | 527 | 426 | 374 | 419 | 370 | 234 | 233 |
| 24 | 421 | 451 | 473 | 406 | 409 | 520 | 397 | 373 | 418 | 314 | 234 | 234 |
| 25 | 433 | 452 | 475 | 438 | 426 | 523 | 397 | 388 | 424 | 360 | 239 | 234 |
| 26 | 438 | 446 | 474 | 468 | 428 | 523 | 419 | 393 | 428 | 317 | 234 | 234 |
| 27 | 427 | 522 | 478 | 467 | 431 | 527 | 418 | 399 | 428 | 360 | 239 | 234 |
| 28 | 427 | 482 | 474 | 467 | 434 | 446 | 419 | 399 | 424 | 314 | 227 | 234 |
| 29 | 424 | 479 | 470 | 454 | --- | 479 | 418 | 399 | 424 | 314 | 227 | 234 |
| 30 | 415 | 452 | 477 | 460 | --- | 440 | 396 | 398 | 429 | 317 | 227 | 234 |
| 31 | 438 | --- | 470 | 440 | --- | 445 | --- | 399 | --- | 319 | 227 | --- |
| MONTH | 413 | 460 | 474 | 446 | 377 | 462 | 480 | 380 | 409 | 392 | 251 | 251 |
| YEAR | 400 | | | | | | | | | | | |

06140500 MILK RIVER AT HAVRE, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.5 | 3.5 | 0.0 | 1.5 | 0.0 | 0.0 | 5.0 | 13.0 | 16.5 | 21.0 | 24.0 | 20.0 |
| 2 | 16.5 | 3.5 | 0.0 | 0.5 | 0.5 | 0.0 | 6.0 | 13.5 | 17.0 | 21.0 | 24.0 | 20.0 |
| 3 | 17.0 | 2.0 | 0.5 | 0.0 | 0.0 | 0.0 | 7.0 | 14.0 | 16.5 | 21.0 | 24.0 | 19.0 |
| 4 | 15.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.5 | 7.0 | 15.0 | 16.0 | 21.0 | 24.0 | 19.0 |
| 5 | 12.5 | 3.0 | 0.0 | 0.0 | 0.5 | 0.5 | 7.5 | 15.5 | 16.0 | 20.0 | 24.0 | 18.0 |
| 6 | 10.0 | 2.5 | 0.5 | 0.0 | 0.5 | 0.5 | 8.0 | 11.5 | 15.5 | 20.5 | 24.5 | 17.0 |
| 7 | 9.0 | 3.0 | 1.5 | 0.5 | 0.0 | 0.5 | 9.5 | 15.0 | 16.0 | 21.0 | 24.5 | 17.0 |
| 8 | 7.0 | 4.0 | 0.5 | 0.5 | 0.5 | 0.5 | 13.5 | 16.0 | 17.5 | 19.5 | 24.5 | 18.0 |
| 9 | 8.0 | 4.0 | 0.0 | 0.0 | 0.5 | 0.5 | 13.0 | 15.0 | 18.5 | 20.0 | 24.5 | 18.0 |
| 10 | 9.0 | 3.0 | 0.0 | 0.0 | 0.5 | 0.5 | 13.0 | 16.0 | 19.0 | 19.0 | 25.0 | 18.0 |
| 11 | 10.5 | 3.0 | 1.0 | 0.0 | 0.5 | 0.5 | 14.0 | 16.0 | 19.0 | 20.0 | 25.0 | 18.0 |
| 12 | 10.0 | 2.5 | 1.0 | 0.0 | 0.5 | 0.5 | 13.0 | 16.0 | 18.5 | 19.5 | 25.0 | 18.0 |
| 13 | 9.5 | 2.5 | 0.5 | 0.0 | 0.5 | 0.5 | 14.0 | 15.5 | 18.5 | 21.0 | 23.0 | 14.5 |
| 14 | 10.0 | 3.5 | 1.5 | 0.0 | 0.5 | 0.5 | 14.0 | 15.5 | 18.5 | 21.0 | 23.0 | 11.5 |
| 15 | 10.0 | 4.0 | 1.0 | 0.0 | 0.5 | 0.5 | 12.0 | 14.0 | 18.5 | 22.0 | 23.0 | 10.5 |
| 16 | 10.5 | 4.0 | 0.5 | 0.0 | 0.5 | 0.5 | 11.0 | 14.0 | 18.5 | 23.0 | 23.0 | 10.5 |
| 17 | 10.0 | 4.0 | 0.0 | 0.5 | 0.5 | 0.5 | 10.0 | 14.0 | 18.0 | 23.0 | 23.0 | 10.5 |
| 18 | 10.0 | 4.0 | 0.0 | 0.0 | 0.5 | 0.5 | 10.0 | 14.5 | 18.0 | 23.0 | 22.5 | 10.5 |
| 19 | 10.0 | 3.5 | 0.0 | 0.5 | 0.5 | 0.5 | 11.0 | 14.5 | 19.0 | 23.5 | 22.5 | 10.5 |
| 20 | 11.0 | 0.0 | 0.5 | 0.5 | 0.5 | 0.5 | 9.5 | 13.0 | 21.0 | 24.0 | 23.0 | 10.5 |
| 21 | 10.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 | 9.0 | 12.5 | 21.0 | 23.5 | 22.5 | 10.5 |
| 22 | 9.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 9.0 | 15.0 | 21.5 | 23.0 | 22.5 | 11.0 |
| 23 | 8.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.5 | 12.0 | 16.0 | 22.0 | 23.0 | 22.5 | 12.0 |
| 24 | 7.5 | 2.0 | 0.0 | 0.0 | 0.5 | 0.5 | 15.0 | 17.0 | 22.5 | 22.0 | 22.5 | 13.5 |
| 25 | 6.0 | 0.5 | 1.0 | 0.0 | 0.5 | 0.5 | 11.0 | 17.5 | 21.0 | 22.5 | 22.5 | 13.0 |
| 26 | 4.0 | 0.5 | 1.0 | 0.0 | 0.0 | 6.0 | 10.5 | 17.5 | 20.0 | 22.0 | 22.0 | 13.0 |
| 27 | 2.0 | 0.0 | 0.0 | 0.5 | 0.5 | 4.0 | 11.5 | 17.5 | 19.5 | 21.0 | 22.5 | 12.5 |
| 28 | 2.5 | 0.0 | 0.5 | 0.5 | 0.0 | 5.0 | 13.0 | 17.0 | 18.0 | 22.0 | 22.0 | 11.5 |
| 29 | 3.0 | 1.0 | 1.0 | 0.0 | --- | 6.0 | 13.0 | 17.0 | 17.5 | 22.5 | 21.5 | 11.5 |
| 30 | 3.5 | 0.5 | 0.0 | 0.0 | --- | 6.0 | 13.0 | 16.5 | 18.0 | 22.5 | 21.0 | 11.5 |
| 31 | 3.5 | --- | 1.0 | 0.0 | --- | 5.0 | --- | 16.0 | --- | 22.5 | 20.5 | --- |
| MONTH | 9.0 | 2.5 | 0.5 | 0.0 | 0.5 | 1.5 | 11.0 | 15.0 | 18.5 | 21.5 | 23.0 | 14.5 |
| YEAR | 10.0 | | | | | | | | | | | |

## 06172000 MILK RIVER AT VANDALIA, MONT.

LOCATION.--Lat 48°21'33", long 106°54'14", in SE¼NW¼ sec.15, T.30 N., R.37 E., Valley County, at gaging station at county bridge 0.3 mile northeast of Vandalia Post Office, 0.9 mile upstream from Bear Creek, 7.1 miles downstream from Vandalia Dam, and at mile 105.3.

DRAINAGE AREA.--20,944 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1969 to September 1971.
Water temperatures: October 1969 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 1,100 mg/l Dec. 19-31, Jan. 1-18; minimum, 229 mg/l Feb. 21-28.
Hardness: Maximum, 440 mg/l Jan. 1-18; minimum, 120 mg/l Feb. 21-28.
Specific conductance: Maximum daily, 1,770 micromhos Dec. 28; minimum daily, 307 micromhos Feb. 22.
Water temperatures: Maximum, 24.0°C Aug. 7; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-11 | -- | 40 | -- | 6.0 | -- | 60 | 30 | 110 | 6.3 | 285 | 0 | 280 |
| 12-26 | -- | 30 | -- | 6.8 | -- | 71 | 35 | 140 | 6.8 | 316 | 0 | 350 |
| 27-31 | -- | 240 | -- | 6.0 | -- | 68 | 33 | 130 | 6.8 | 301 | 0 | 330 |
| NOV. | | | | | | | | | | | | |
| 01-16 | -- | 198 | -- | 7.8 | -- | 83 | 39 | 160 | 6.6 | 322 | 0 | 400 |
| 17-30 | -- | 212 | -- | 7.7 | -- | 85 | 44 | 180 | 7.0 | 360 | 0 | 430 |
| DEC. | | | | | | | | | | | | |
| 01-18 | -- | 162 | -- | 6.8 | -- | 80 | 50 | 190 | 9.4 | 340 | 0 | 480 |
| 19-31 | -- | 151 | -- | 8.9 | -- | 81 | 47 | 210 | 9.8 | 324 | 18 | 530 |
| JAN. | | | | | | | | | | | | |
| 01-18 | -- | 148 | -- | 11 | 80 | 97 | 47 | 190 | 8.2 | 413 | 0 | 490 |
| 19-31 | -- | 175 | -- | 11 | 80 | 88 | 44 | 180 | 7.4 | 373 | 0 | 430 |
| FEB. | | | | | | | | | | | | |
| 01-11 | -- | 245 | -- | 12 | 20 | 53 | 38 | 160 | 7.7 | 296 | -- | 360 |
| 12-20 | -- | 370 | -- | 9.1 | 40 | 55 | 27 | 96 | 12 | 264 | -- | 210 |
| 21-28 | -- | 2180 | -- | 6.1 | 180 | 28 | 12 | 29 | 8.4 | 115 | -- | 83 |
| MAR. | | | | | | | | | | | | |
| 01-09 | -- | 821 | -- | 7.6 | 140 | 30 | 15 | 42 | 9.4 | 151 | -- | 110 |
| 10-21 | -- | 814 | -- | 8.3 | 60 | 39 | 19 | 78 | 8.9 | 186 | -- | 190 |
| 22-31 | -- | 1260 | -- | 7.3 | 140 | 28 | 14 | 52 | 7.1 | 132 | -- | 130 |
| APR. | | | | | | | | | | | | |
| 01-14 | -- | 2810 | -- | 7.0 | 40 | 30 | 13 | 55 | 5.2 | 122 | 0 | 150 |
| 15-30 | -- | 914 | -- | 7.8 | 20 | 43 | 22 | 82 | 6.7 | 190 | 0 | 230 |
| MAY | | | | | | | | | | | | |
| 01-14 | -- | 747 | -- | 6.9 | 10 | 50 | 26 | 97 | 6.9 | 218 | 0 | 240 |
| 15-31 | -- | 303 | -- | 6.5 | 20 | 49 | 28 | 100 | 7.6 | 256 | 0 | 240 |
| JUNE | | | | | | | | | | | | |
| 01-30 | -- | 286 | -- | 6.2 | 10 | 46 | 25 | 87 | 6.1 | 242 | 0 | 200 |
| JULY | | | | | | | | | | | | |
| 01-31 | -- | 97 | -- | 6.8 | 10 | 52 | 29 | 110 | 6.4 | 274 | 0 | 260 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 40 | -- | 7.4 | 20 | 58 | 31 | 130 | 5.9 | 308 | 0 | 280 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 101 | -- | 6.4 | 10 | 51 | 26 | 93 | 5.6 | 270 | 0 | 210 |
| WTD. AVG. | -- | -- | -- | 7.3 | -- | 42 | 21 | 80 | 7.0 | 190 | 0 | 203 |
| TIME WTD. AVG. | -- | 429 | -- | 7.6 | -- | 58 | 31 | 120 | 7.2 | 272 | 1 | 290 |
| TONS PER DAY | -- | -- | -- | 8.5 | -- | 49 | 25 | 93 | 8.2 | 221 | 0 | 236 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 20... | 1345 | 27 | 6.5 | 6.5 | 0 | 70 | 37 | 150 | 5.6 | 322 | 0 | 350 |
| DEC. | | | | | | | | | | | | |
| 23... | 1045 | 150 | .5 | 10 | 0 | 110 | 54 | 220 | 8.2 | 437 | 0 | 530 |
| JAN., 1971 | | | | | | | | | | | | |
| 21... | 1030 | 170 | .0 | 11 | 110 | 98 | 41 | 180 | 7.3 | 410 | 0 | 400 |
| APR. | | | | | | | | | | | | |
| 20... | 1030 | 805 | 8.0 | 7.2 | 50 | 46 | 19 | 77 | 8.9 | 148 | -- | 220 |
| JULY | | | | | | | | | | | | |
| 20... | 1200 | 41 | 23.5 | 7.7 | 20 | 68 | 34 | 120 | 6.4 | 327 | 0 | 300 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 20... | 1345 | 27 | -- | 190 | -- |
| NOV. | | | | | |
| 23... | 1030 | 170 | .020 | -- | -- |
| DEC. | | | | | |
| 23... | 1045 | 150 | .010 | 250 | -- |
| JAN., 1971 | | | | | |
| 21... | 1030 | 170 | .020 | 260 | 300 |
| FEB. | | | | | |
| 19... | 1100 | 400 | .080 | -- | -- |

06172000 MILK RIVER AT VANDALIA, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 1,100 mg/l Dec. 19-31, 1970, Jan. 1-18, 1971; minimum, 229 mg/l Feb. 21-28, 1971.
Hardness: Maximum, 451 mg/l Dec. 8-31, 1969; minimum, 104 mg/l Apr. 12-18, 1970.
Specific conductance: Maximum daily, 1,770 micromhos Dec. 28, 1970; minimum daily, 307 micromhos Feb. 22, 1971.
Water temperatures: Maximum observed, 26.5°C July 11, 1970; minimum, freezing point on many days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Dissolved solids, 1,190 mg/l Dec. 23; hardness, 490 mg/l Dec. 23.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-11 | 7.1 | .3 | -- | -- | 644 | .94 | 74.7 | 270 | 37 | 2.9 | 1040 | 7.9 |
| 12-26 | 18 | .3 | -- | -- | 777 | 1.07 | 63.8 | 320 | 62 | 3.4 | 1150 | 8.0 |
| 27-31 | 17 | .4 | -- | -- | 743 | 1.04 | 494 | 310 | 59 | 3.2 | 1100 | 7.8 |
| NOV. | | | | | | | | | | | | |
| 01-16 | 21 | .3 | -- | -- | 872 | 1.20 | 471 | 370 | 100 | 3.6 | 1290 | 7.0 |
| 17-30 | 27 | .4 | -- | -- | 962 | 1.33 | 560 | 390 | 98 | 3.9 | 1380 | 7.0 |
| DEC. | | | | | | | | | | | | |
| 01-18 | 29 | .4 | -- | -- | 1010 | 1.40 | 451 | 410 | 130 | 4.1 | 1410 | 8.1 |
| 19-31 | 31 | .4 | -- | -- | 1100 | 1.54 | 461 | 400 | 99 | 4.6 | 1070 | 8.3 |
| JAN. | | | | | | | | | | | | |
| 01-18 | 29 | .5 | .20 | .00 | 1100 | 1.50 | 440 | 440 | 100 | 4.0 | 1520 | 8.3 |
| 19-31 | 26 | .4 | .10 | .10 | 970 | 1.32 | 458 | 400 | 94 | 3.9 | 1380 | 8.5 |
| FEB. | | | | | | | | | | | | |
| 01-11 | 24 | .2 | .30 | .03 | 802 | 1.09 | 531 | 290 | 46 | 4.1 | 1230 | 8.2 |
| 12-20 | 15 | .2 | .10 | .00 | 555 | .75 | 554 | 250 | 32 | 2.7 | 909 | 8.2 |
| 21-28 | 5.4 | .2 | .10 | .06 | 229 | .31 | 1350 | 120 | 25 | 1.2 | 391 | 7.7 |
| MAR. | | | | | | | | | | | | |
| 01-09 | 6.8 | .2 | .10 | .03 | 296 | .40 | 656 | 140 | 13 | 1.6 | 500 | 7.9 |
| 10-21 | 9.6 | .2 | .00 | .09 | 445 | .61 | 978 | 180 | 23 | 2.6 | 702 | 8.2 |
| 22-31 | 7.3 | .2 | .10 | .00 | 311 | .42 | 1060 | 130 | 19 | 2.0 | 535 | 8.1 |
| APR. | | | | | | | | | | | | |
| 01-14 | 4.9 | .2 | .01 | .03 | 325 | .44 | 2470 | 130 | 28 | 2.1 | 513 | 8.0 |
| 15-30 | 8.1 | .2 | .01 | .03 | 493 | .67 | 1220 | 200 | 42 | 2.5 | 760 | 8.0 |
| MAY | | | | | | | | | | | | |
| 01-14 | 10 | .3 | .04 | .06 | 545 | .74 | 1100 | 230 | 53 | 2.8 | 819 | 8.2 |
| 15-31 | 11 | .3 | .00 | .03 | 568 | .77 | 465 | 240 | 28 | 2.8 | 893 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 01-30 | 12 | .8 | .01 | .03 | 502 | .68 | 388 | 220 | 19 | 2.6 | 793 | 8.2 |
| JULY | | | | | | | | | | | | |
| 01-31 | 15 | .7 | .01 | .03 | 615 | .84 | 161 | 250 | 24 | 3.0 | 962 | 8.2 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 11 | .2 | .00 | .03 | 675 | .92 | 72.9 | 270 | 20 | 3.4 | 1020 | 8.3 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 12 | .7 | .02 | .06 | 538 | .73 | 147 | 230 | 13 | 2.6 | 832 | 8.3 |
| WTD. AVG. | 10 | .3 | -- | -- | 466 | .64 | -- | 195 | 36 | 2.4 | 717 | 8.0 |
| TIME WTD. AVG. | 16 | .4 | -- | -- | 664 | .91 | -- | 272 | 48 | 3.1 | 981 | 8.1 |
| TONS PER DAY | 12 | .3 | -- | -- | 541 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 20... | 19 | .3 | -- | -- | 798 | 1.11 | 59.6 | 330 | 63 | 3.6 | 1190 | 7.9 |
| DEC. | | | | | | | | | | | | |
| 23... | 35 | .4 | -- | -- | 1190 | 1.62 | 482 | 490 | 140 | 4.3 | 1620 | 7.0 |
| JAN., 1971 | | | | | | | | | | | | |
| 21... | 24 | .5 | .00 | .05 | 960 | 1.31 | 441 | 410 | 74 | 3.9 | 1320 | 7.8 |
| APR. | | | | | | | | | | | | |
| 20... | 8.3 | .2 | .20 | .15 | 461 | .63 | 1000 | 190 | 72 | 2.4 | 706 | 7.7 |
| JULY | | | | | | | | | | | | |
| 20... | 15 | .6 | .09 | .06 | 713 | .97 | 78.9 | 310 | 42 | 3.0 | 1130 | 7.6 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| APR. | | | | | |
| 20... | 1030 | 805 | .060 | 120 | 0 |
| MAY | | | | | |
| 20... | 1100 | 120 | .050 | -- | -- |
| JUNE | | | | | |
| 21... | 1400 | 245 | .050 | -- | -- |
| JULY | | | | | |
| 20... | 1200 | 41 | .030 | 230 | 8 |
| AUG. | | | | | |
| 24... | 1200 | 52 | .070 | -- | -- |
| SEP. | | | | | |
| 16... | 1200 | 79 | .060 | -- | -- |

06172000 MILK RIVER AT VANDALIA, MONT.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 958 | 1240 | 1530 | 1710 | 1400 | 368 | 464 | 826 | 721 | 897 | 987 | 890 |
| 2 | 964 | 1370 | 1530 | 1630 | 1390 | 413 | 442 | 846 | 758 | 1000 | 924 | 854 |
| 3 | 964 | 1300 | 1500 | 1610 | 1370 | 452 | 478 | 826 | 758 | 989 | 924 | 851 |
| 4 | 993 | 1300 | 1500 | 1590 | 1310 | 514 | 428 | 875 | 758 | 978 | 930 | 854 |
| 5 | 990 | 1300 | 1530 | 1590 | 1280 | 483 | 442 | 892 | 758 | 928 | 1090 | 828 |
| 6 | 993 | 1310 | 1550 | 1570 | 1330 | 517 | 485 | 839 | 758 | 944 | 1030 | 808 |
| 7 | 997 | 1290 | 1600 | 1570 | 1340 | 508 | 494 | 824 | 754 | 912 | 1120 | 810 |
| 8 | 1030 | 1260 | 1550 | 1530 | 1370 | 534 | 530 | 866 | 773 | 954 | 1120 | 906 |
| 9 | 1030 | 1250 | 1490 | 1530 | 1280 | 564 | 527 | 849 | 777 | 993 | 1110 | 816 |
| 10 | 1060 | 1360 | 1480 | 1530 | 1220 | 596 | 551 | 878 | 799 | 1040 | 1090 | 825 |
| 11 | 1070 | 1230 | 1500 | 1530 | 1080 | 596 | 557 | 829 | 799 | 1030 | 1090 | 805 |
| 12 | 1100 | 1250 | 1530 | 1530 | 945 | 612 | 562 | 849 | 844 | 1030 | 1050 | 788 |
| 13 | 1100 | 1290 | 1600 | 1540 | 888 | 631 | 562 | 836 | 854 | 1040 | 1050 | 780 |
| 14 | 1100 | 1290 | 1530 | 1530 | 888 | 649 | 635 | 778 | 842 | 1040 | 1030 | 780 |
| 15 | 1100 | 1250 | 1540 | 1530 | 835 | 685 | 718 | 829 | 821 | 1040 | 1020 | 764 |
| 16 | 1110 | 1270 | 1530 | 1510 | 842 | 814 | 736 | 839 | 808 | 1040 | 1030 | 780 |
| 17 | 1150 | 1340 | 1550 | 1510 | 862 | 881 | 745 | 839 | 761 | 1040 | 1030 | 780 |
| 18 | 1160 | 1390 | 1550 | 1530 | 905 | 737 | 718 | 831 | 767 | 1080 | 1020 | 780 |
| 19 | 1190 | 1520 | 1600 | 1460 | 980 | 654 | 734 | 875 | 787 | 1080 | 1020 | 780 |
| 20 | 1180 | 1630 | 1580 | 1450 | 717 | 622 | 716 | 904 | 819 | 1080 | 984 | 780 |
| 21 | 1190 | 1330 | 1600 | 1450 | 341 | 657 | 683 | 962 | 799 | 1100 | 984 | 786 |
| 22 | 1200 | 1310 | 1640 | 1440 | 307 | 533 | 692 | 937 | 781 | 1100 | 981 | 805 |
| 23 | 1220 | 1360 | 1620 | 1440 | 319 | 489 | 700 | 937 | 799 | 1100 | 984 | 839 |
| 24 | 1240 | 1480 | 1680 | 1440 | 446 | 475 | 697 | 969 | 793 | 934 | 984 | 864 |
| 25 | 1250 | 1410 | 1730 | 1440 | 449 | 482 | 772 | 937 | 797 | 928 | 981 | 876 |
| 26 | 1250 | 1450 | 1730 | 1430 | 356 | 497 | 815 | 904 | 821 | 882 | 1000 | 876 |
| 27 | 1080 | 1420 | 1730 | 1390 | 338 | 517 | 842 | 878 | 821 | --- | 1020 | 876 |
| 28 | 1100 | 1420 | 1770 | 1410 | 340 | 521 | 883 | 824 | 819 | 903 | 1020 | 876 |
| 29 | 1100 | 1430 | 1740 | 1410 | --- | 543 | 897 | 875 | 837 | 961 | 1030 | 876 |
| 30 | 1180 | 1470 | 1730 | 1410 | --- | 572 | 842 | 803 | 854 | 978 | 987 | 876 |
| 31 | 1200 | --- | 1730 | 1410 | --- | 525 | --- | 741 | --- | 968 | 924 | --- |
| MONTH | 1100 | 1350 | 1600 | 1500 | 897 | 569 | 645 | 861 | 795 | 1000 | 1020 | 827 |
| YEAR | 1020 | | | | | | | | | | | |

06174200 MILK RIVER NEAR GLASGOW, MONT.

LOCATION.--Lat 48°09'36", long 106°35'31", in NE¼NW¼ sec.29, T.28 N., R.40 E., Valley County, at bridge on State Highway 24, 0.2 mile downstream from Willow Creek, 2.9 miles southeast of Glasgow, and at mile 58.0.

DRAINAGE AREA.--23,200 sq mi, approximately.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 20... | 1200 | 100 | 68 | 34 | 141 | 330 | 22 | .4 | .00 |
| NOV. | | | | | | | | | |
| 23... | 1300 | 120 | 93 | 37 | -- | 480 | 25 | -- | .00 |
| DEC. | | | | | | | | | |
| 23... | 1230 | 160 | 100 | 52 | -- | 510 | 35 | -- | .5 |
| JAN. | | | | | | | | | |
| 21... | 1400 | 200 | 94 | 51 | 190 | 460 | 31 | .5 | -- |
| APR. | | | | | | | | | |
| 01... | 1100 | 3000 | 27 | 11 | -- | 180 | 3.8 | -- | -- |
| 20... | 1300 | 600 | 50 | 21 | 49 | 180 | 8.9 | .5 | -- |
| MAY | | | | | | | | | |
| 20... | 1400 | 180 | 43 | 25 | -- | 250 | 17 | -- | -- |
| JUNE | | | | | | | | | |
| 22... | 0930 | 400 | 40 | 26 | -- | 200 | 14 | -- | -- |
| JULY | | | | | | | | | |
| 20... | 1400 | 30 | 75 | 36 | 140 | 340 | 32 | .6 | -- |
| AUG. | | | | | | | | | |
| 24... | 1000 | 90 | 67 | 34 | -- | 340 | 24 | -- | -- |
| SEP. | | | | | | | | | |
| 21... | 1000 | 85 | 53 | 26 | -- | 210 | 17 | -- | -- |

06172000 MILK RIVER AT VANDALIA, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.5 | 4.0 | 0.5 | 1.0 | 0.0 | 0.5 | 1.0 | 11.5 | 16.0 | 20.0 | 21.0 | 20.0 |
| 2 | 13.0 | 3.5 | 0.5 | 1.0 | 0.0 | 0.0 | 1.0 | 12.0 | 16.5 | 21.0 | 21.5 | 19.5 |
| 3 | 11.5 | 3.5 | 0.0 | 1.0 | 0.0 | 0.0 | 2.0 | 13.5 | 17.0 | 21.0 | 21.5 | 19.0 |
| 4 | 11.5 | 2.5 | 0.0 | 0.5 | 0.5 | 0.0 | 1.5 | 13.5 | 17.5 | 21.0 | 21.0 | 19.0 |
| 5 | 12.0 | 2.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.5 | 15.0 | 18.0 | 21.0 | 21.5 | 19.0 |
| 6 | 10.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.5 | 2.0 | 15.0 | 17.5 | 21.0 | 22.0 | 19.0 |
| 7 | 8.0 | 2.0 | 0.0 | 0.5 | 0.0 | 0.0 | 4.0 | 15.0 | 17.5 | 20.0 | 24.0 | 19.0 |
| 8 | 7.5 | 1.5 | 0.5 | 0.5 | 0.5 | 0.5 | 4.5 | 15.0 | 17.0 | 20.0 | 23.5 | 18.5 |
| 9 | 7.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.5 | 5.5 | 15.5 | 18.0 | 20.0 | 23.5 | 18.0 |
| 10 | 7.0 | 2.0 | 0.0 | 0.0 | 1.0 | 1.0 | 6.5 | 15.0 | 18.0 | 20.0 | 22.0 | 18.5 |
| 11 | 7.0 | 2.0 | 0.5 | 0.0 | 1.5 | 1.0 | 5.5 | 15.0 | 19.5 | 20.5 | 22.0 | 18.0 |
| 12 | 8.5 | 2.0 | 1.0 | 0.0 | 1.0 | 1.0 | 5.5 | 16.0 | 20.0 | 20.0 | 23.0 | 17.5 |
| 13 | 8.0 | 2.0 | 1.0 | 0.0 | 1.0 | 1.0 | 6.0 | 17.5 | 20.0 | 20.0 | 23.0 | 17.0 |
| 14 | 7.5 | 2.5 | 0.5 | 0.0 | 1.0 | 1.0 | 7.0 | 17.5 | 20.0 | 19.0 | 23.0 | 15.0 |
| 15 | 6.0 | 2.0 | 0.0 | 0.0 | 1.0 | 1.0 | 8.0 | 14.0 | 20.0 | 20.0 | 23.5 | 14.5 |
| 16 | 6.0 | 2.0 | 0.5 | 0.5 | 1.0 | 1.0 | 9.0 | 15.5 | 20.0 | 20.5 | 23.0 | 13.0 |
| 17 | 7.5 | 2.5 | 0.5 | 0.0 | 0.5 | 1.0 | 9.5 | 14.0 | 20.0 | 22.0 | 23.0 | 13.0 |
| 18 | 6.5 | 2.5 | 0.5 | 0.0 | 0.5 | 1.0 | 8.5 | 12.0 | 20.0 | 21.0 | 23.0 | 12.5 |
| 19 | 7.0 | 2.5 | 0.0 | 0.0 | 1.0 | 1.0 | 8.5 | 13.0 | 20.5 | 22.0 | 23.0 | 13.0 |
| 20 | 7.0 | 1.5 | 0.0 | 1.0 | 0.5 | 2.0 | 9.0 | 14.0 | 20.0 | 21.5 | 23.0 | 13.0 |
| 21 | 7.5 | 1.0 | 0.0 | 0.5 | 0.0 | 1.5 | 8.5 | 14.0 | 22.0 | 22.0 | 23.5 | 11.5 |
| 22 | 7.0 | 0.5 | 0.0 | 0.5 | 0.0 | 0.0 | 8.5 | 13.5 | 22.5 | 21.5 | 23.5 | 12.5 |
| 23 | 7.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 | 9.5 | 13.0 | 23.0 | 22.0 | 23.0 | 12.0 |
| 24 | 7.0 | 1.0 | 0.5 | 0.0 | 0.5 | 0.5 | 10.5 | 14.0 | 22.0 | 23.0 | 20.0 | 12.0 |
| 25 | 6.5 | 0.0 | 0.5 | 0.0 | 0.5 | 0.5 | 12.0 | 15.0 | 23.0 | 22.0 | 20.0 | 13.0 |
| 26 | 5.5 | 0.5 | 0.0 | 0.0 | 1.0 | 0.5 | 10.0 | 16.0 | 23.0 | 21.0 | 20.0 | 13.0 |
| 27 | 5.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 | 9.5 | 17.0 | 21.5 | 22.5 | 21.0 | 12.0 |
| 28 | 4.5 | 0.5 | 0.5 | 0.0 | 0.5 | 0.5 | 8.5 | 18.5 | 21.0 | 21.0 | 21.5 | 11.5 |
| 29 | 4.5 | 0.5 | 0.5 | 0.0 | --- | 1.0 | 9.5 | 18.0 | 20.0 | 19.0 | 21.0 | 11.5 |
| 30 | 4.5 | 1.0 | 1.0 | 0.0 | --- | 1.5 | 10.0 | 18.0 | 20.0 | 20.0 | 19.5 | 12.0 |
| 31 | 4.0 | --- | 1.0 | 0.0 | --- | 1.0 | --- | 16.5 | --- | 21.0 | 19.5 | --- |
| MONTH | 7.5 | 1.5 | 0.5 | 0.0 | 0.5 | 0.5 | 7.0 | 15.0 | 19.5 | 21.0 | 22.0 | 15.0 |
| YEAR | 9.5 | | | | | | | | | | | |

06174200 MILK RIVER NEAR GLASGOW, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

REMARKS.--Water discharge estimated from records for station 06174500, Milk River at Nashua.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 20... | -- | 780 | 1.06 | 211 | 310 | .01 | .070 | 2.1 |
| NOV. | | | | | | | | |
| 23... | -- | 1090 | 1.48 | 353 | 380 | .05 | .060 | 2.5 |
| DEC. | | | | | | | | |
| 23... | -- | 1170 | 1.59 | 505 | 470 | .00 | .030 | 3.4 |
| JAN. | | | | | | | | |
| 21... | .10 | 1060 | 1.44 | 572 | 440 | .23 | -- | 1.0 |
| APR. | | | | | | | | |
| 01... | .20 | 316 | .43 | 2560 | 110 | .31 | 1.0 | 4.0 |
| 20... | .10 | 498 | .68 | 807 | 210 | .09 | .26 | 2.8 |
| MAY | | | | | | | | |
| 20... | .00 | 588 | -- | 286 | 210 | .06 | .50 | 2.2 |
| JUNE | | | | | | | | |
| 22... | .03 | 572 | .78 | 618 | 210 | .22 | .15 | 4.7 |
| JULY | | | | | | | | |
| 20... | .08 | 790 | 1.07 | 64.0 | 340 | .14 | .10 | 2.2 |
| AUG. | | | | | | | | |
| 24... | .00 | 828 | 1.13 | 201 | 310 | .14 | .15 | 1.7 |
| SEP. | | | | | | | | |
| 21... | .69 | 546 | .74 | 125 | 240 | .07 | .080 | 2.3 |

06174200 MILK RIVER NEAR GLASGOW, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 20... | 1200 | 100 | 0 | 0 | -- | 0 | 0 | 0 | -- |
| DEC. | | | | | | | | | |
| 23... | 1230 | 160 | -- | -- | -- | -- | -- | -- | .00 |
| JAN. | | | | | | | | | |
| 21... | 1400 | 200 | 0 | 0 | 270 | 0 | 0 | 2 | .00 |
| APR. | | | | | | | | | |
| 20... | 1300 | 600 | 0 | 0 | 110 | 0 | 0 | 0 | .00 |
| JULY | | | | | | | | | |
| 20... | 1400 | 30 | 8 | 0 | 250 | 0 | 0 | 3 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 20... | 1200 | 100 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 21... | 1400 | 200 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 20... | 1300 | 600 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 20... | 1400 | 30 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 20... | 1200 | 6.0 | 10.5 | 1040 | 11.0 | 8.3 | 66 |
| NOV. | | | | | | | |
| 23... | 1300 | .0 | -8.0 | 1420 | 12.6 | 8.3 | 110 |
| DEC. | | | | | | | |
| 23... | 1230 | .5 | -12.0 | 1510 | 12.2 | 7.9 | 110 |
| JAN. | | | | | | | |
| 21... | 1400 | .0 | -1.0 | 1550 | 7.6 | 7.6 | 570 |
| APR. | | | | | | | |
| 01... | 1100 | 2.0 | -1.0 | 500 | 12.0 | 7.7 | 120 |
| 20... | 1300 | 8.0 | 14.0 | 700 | 10.0 | 8.1 | 400 |
| MAY | | | | | | | |
| 20... | 1400 | 12.5 | 9.0 | 650 | 8.2 | 8.0 | 150 |
| JUNE | | | | | | | |
| 22... | 0930 | 23.0 | 24.5 | 810 | 6.8 | 8.2 | 85 |
| JULY | | | | | | | |
| 20... | 1400 | 25.0 | 33.0 | 1150 | 8.0 | 8.3 | 150 |
| AUG. | | | | | | | |
| 24... | 1000 | 19.5 | 17.5 | 1190 | 7.4 | 8.5 | 270 |
| SEP. | | | | | | | |
| 21... | 1000 | 10.5 | 6.5 | 850 | 10.0 | 8.5 | 130 |

06174200 MILK RIVER NEAR GLASGOW, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 20... | 0 | 72 | .0 | 0 | 2 | 0 | 0 | 10 |
| DEC. | | | | | | | | |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | |
| 21... | 0 | 0 | .0 | 0 | 0 | 19 | 0 | 20 |
| APR. | | | | | | | | |
| 20... | 0 | 0 | .2 | 1 | 12 | 0 | 0 | 10 |
| JULY | | | | | | | | |
| 20... | 0 | 1 | .1 | 22 | 2 | 6 | 0 | 7 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 20... | .00 | .00 | .00 | .00 | .00 | .00 | -- | -- | -- |
| JAN., 1971 | | | | | | | | | |
| 21... | .00 | .00 | .00 | .00 | .00 | .00 | .16 | .00 | .00 |
| APR. | | | | | | | | | |
| 20... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | |
| 20... | .00 | .00 | -- | -- | -- | -- | .70 | .01 | .00 |

06175400 FRAZER RESERVOIR OUTLET AT FRAZER, MONT.

LOCATION.--Lat 48°03'18", long 106°00'28", in SE¼NW¼ sec.35, T.27 N., R.44 E., Valley County, at outlet of Frazer Reservoir, 1 mile southeast of Frazer.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01... | 0930 | 10 | 12.0 | 1.3 | 430 | 38 | 15 | 120 | 8.4 | 182 | 13 | 220 |
| MAY | | | | | | | | | | | | |
| 18... | 0930 | 9.0 | 11.0 | 6.5 | 20 | 42 | 15 | 82 | 7.8 | 197 | 0 | 190 |
| JUNE | | | | | | | | | | | | |
| 01... | 1400 | 6.0 | 14.0 | 7.9 | 20 | 44 | 16 | 85 | 8.1 | 210 | 0 | 180 |
| 24... | 1515 | 9.0 | 22.0 | 11 | 10 | 44 | 17 | 90 | 8.4 | 208 | 0 | 200 |
| JULY | | | | | | | | | | | | |
| 07... | 1030 | 6.0 | 18.0 | 5.3 | 20 | 37 | 16 | 94 | 8.2 | 176 | 0 | 210 |
| AUG. | | | | | | | | | | | | |
| 02... | 1600 | 6.0 | 20.0 | 7.7 | 20 | 41 | 17 | 97 | 8.6 | 197 | 0 | 210 |
| SEP. | | | | | | | | | | | | |
| 09... | 1445 | 6.0 | 21.0 | 7.3 | 10 | 38 | 17 | 110 | 9.2 | 203 | 0 | 240 |

MISSOURI RIVER MAIN STEM

06177000 MISSOURI RIVER NEAR WOLF POINT, MONT.

LOCATION.--Lat 48°03'57", long 105°32'12", in SW¼NW¼ sec.28, T.27 N., R.48 E., McCone County, at gaging station at bridge on State Highway 13, 5 miles southeast of Wolf Point, 7.8 miles downstream from Wolf Creek, and at mile 1,701.4.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1400 | 12500 | 10.5 | 7.5 | 30 | 57 | 23 | 52 | 4.2 | 193 | 0 | 170 |
| NOV. | | | | | | | | | | | | |
| 25... | 1315 | 10800 | 2.5 | 6.5 | 20 | 60 | 20 | 53 | 4.3 | 196 | 0 | 180 |
| DEC. | | | | | | | | | | | | |
| 23... | 1345 | 8330 | .0 | 7.7 | 30 | 65 | 24 | 54 | 4.8 | 203 | 0 | 180 |
| JAN. | | | | | | | | | | | | |
| 20... | 1430 | 15100 | 1.5 | 7.0 | 120 | 61 | 20 | 47 | 4.2 | 194 | 0 | 180 |
| FEB. | | | | | | | | | | | | |
| 22... | 1100 | 15600 | 2.0 | 7.2 | 110 | 62 | 19 | 47 | 4.3 | 196 | 0 | 160 |
| MAR. | | | | | | | | | | | | |
| 24... | 1330 | 11700 | 3.0 | 7.3 | 30 | 57 | 21 | 56 | 4.3 | 192 | -- | 180 |
| APR. | | | | | | | | | | | | |
| 22... | 1400 | 14900 | 5.5 | 7.6 | 30 | 59 | 22 | 61 | 6.1 | 189 | -- | 180 |
| MAY | | | | | | | | | | | | |
| 21... | 1200 | 14300 | 8.0 | 6.8 | 20 | 59 | 22 | 52 | 3.8 | 197 | -- | 160 |
| JUNE | | | | | | | | | | | | |
| 23... | 1100 | 12400 | 14.5 | 6.9 | 20 | 56 | 22 | 44 | 4.0 | 201 | 0 | 160 |
| JULY | | | | | | | | | | | | |
| 22... | 1100 | 11100 | 14.5 | 7.2 | 10 | 53 | 22 | 44 | 3.6 | 194 | 0 | 160 |
| AUG. | | | | | | | | | | | | |
| 26... | 1330 | 10300 | 17.0 | 8.4 | 10 | 58 | 21 | 46 | 3.6 | 196 | 0 | 160 |
| SEP. | | | | | | | | | | | | |
| 22... | 1300 | 9070 | 11.0 | 9.4 | 40 | 54 | 21 | 46 | 3.8 | 207 | 0 | 160 |

06175400 FRAZER RESERVOIR OUTLET AT FRAZER, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: October and November 1961, April 1962 to September 1971.

REMARKS.--No flow during most of water year.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01... | 19 | .5 | -- | -- | 523 | .72 | 14.3 | 150 | 0 | 4.2 | 900 | 8.6 |
| MAY | | | | | | | | | | | | |
| 18... | 5.9 | .5 | .03 | .03 | 447 | .61 | 10.9 | 170 | 5 | 2.8 | 710 | 7.4 |
| JUNE | | | | | | | | | | | | |
| 01... | 5.8 | .5 | .02 | .06 | 451 | .61 | 7.31 | 180 | 4 | 2.8 | 725 | 7.6 |
| 24... | 6.1 | .4 | .04 | .21 | 480 | .65 | 11.7 | 180 | 9 | 2.9 | 715 | 8.0 |
| JULY | | | | | | | | | | | | |
| 07... | 6.3 | .4 | .09 | .21 | 465 | .63 | 7.53 | 160 | 14 | 3.3 | 712 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 02... | 6.5 | .5 | .04 | .06 | 485 | .66 | 7.86 | 170 | 11 | 3.2 | 778 | 7.3 |
| SEP. | | | | | | | | | | | | |
| 09... | 9.3 | .5 | .08 | .28 | 532 | .72 | 8.62 | 160 | 0 | 3.7 | 846 | 7.7 |

MISSOURI RIVER MAIN STEM

06177000 MISSOURI RIVER NEAR WOLF POINT, MONT.--Continued

DRAINAGE AREA.--82,290 sq mi.

PERIOD OF RECORD.--Chemical analyses: March 1949 to September 1951, September 1961 to September 1962, July 1965 to September 1968, October 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 10 | .7 | -- | -- | 424 | .59 | 14700 | 240 | 77 | 1.5 | 636 | 8.2 |
| NOV. | | | | | | | | | | | | |
| 25... | 9.2 | .7 | -- | -- | 429 | .59 | 12700 | 230 | 71 | 1.5 | 651 | 8.3 |
| DEC. | | | | | | | | | | | | |
| 23... | 9.4 | .7 | -- | -- | 447 | .62 | 10200 | 260 | 92 | 1.5 | 676 | 7.0 |
| JAN. | | | | | | | | | | | | |
| 20... | 7.5 | .7 | .00 | .00 | 420 | .57 | 17100 | 230 | 71 | 1.3 | 591 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 22... | 7.4 | .5 | .00 | .05 | 410 | .56 | 17300 | 230 | 69 | 1.3 | 590 | 8.0 |
| MAR. | | | | | | | | | | | | |
| 24... | 7.2 | .8 | .10 | .06 | 429 | .58 | 13600 | 230 | 71 | 1.6 | 630 | 7.9 |
| APR. | | | | | | | | | | | | |
| 22... | 9.3 | .6 | .00 | .09 | 439 | .60 | 17700 | 240 | 83 | 1.7 | 672 | 8.2 |
| MAY | | | | | | | | | | | | |
| 21... | 9.3 | .5 | .00 | .06 | 410 | .56 | 15800 | 240 | 76 | 1.5 | 648 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 23... | 7.5 | .7 | .01 | .06 | 400 | .54 | 13400 | 230 | 65 | 1.3 | 643 | 8.0 |
| JULY | | | | | | | | | | | | |
| 22... | 7.3 | .7 | .03 | .03 | 394 | .54 | 11800 | 220 | 64 | 1.3 | 614 | 8.4 |
| AUG. | | | | | | | | | | | | |
| 26... | 7.7 | .8 | .03 | .06 | 402 | .55 | 11200 | 230 | 70 | 1.3 | 638 | 7.9 |
| SEP. | | | | | | | | | | | | |
| 22... | 9.0 | .6 | .11 | .03 | 406 | .55 | 9940 | 220 | 51 | 1.3 | 628 | 8.1 |

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.
(Irrigation network station)

LOCATION.--Lat 48°07'24", long 104°28'30", in SE¼NW¼ sec.3, T.27 N., R.56 E., Richland County, at gaging station at bridge on State Highway 16, 3 miles southeast of Culbertson, 9.6 miles downstream from Big Muddy Creek, and at mile 1,620.76.

DRAINAGE AREA.--91,557 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1965 to September 1971.
Water temperatures: July 1965 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 21... | 1330 | 14300 | 9.5 | 7.1 | 120 | 58 | 22 | 52 | 4.2 | 194 | 0 | 170 |
| NOV. | | | | | | | | | | | | |
| 24... | 1330 | 10000 | .0 | 7.2 | 0 | 60 | 21 | 56 | 4.4 | 198 | 0 | 180 |
| DEC. | | | | | | | | | | | | |
| 21... | 1300 | 10000 | .0 | 7.9 | 150 | 58 | 23 | 52 | 4.1 | 201 | 0 | 180 |
| JAN. | | | | | | | | | | | | |
| 19... | 1200 | 15500 | .5 | 6.5 | 280 | 57 | 23 | 49 | 3.9 | 196 | 0 | 170 |
| FEB. | | | | | | | | | | | | |
| 22... | 1330 | 18000 | .0 | 7.2 | 130 | 52 | 22 | 47 | 4.3 | 190 | 0 | 130 |
| MAR. | | | | | | | | | | | | |
| 24... | 1000 | 14000 | 3.0 | 6.8 | 40 | 54 | 22 | 50 | 4.1 | 195 | -- | 150 |
| APR. | | | | | | | | | | | | |
| 21... | 1300 | 16500 | 5.5 | 7.2 | 50 | 45 | 21 | 78 | 6.4 | 166 | -- | 220 |
| MAY | | | | | | | | | | | | |
| 21... | 1600 | 14400 | 10.0 | 7.0 | 20 | 61 | 23 | 41 | 4.1 | 193 | -- | 160 |
| JUNE | | | | | | | | | | | | |
| 22... | 1400 | 12900 | 18.0 | 7.0 | 10 | 54 | 23 | 51 | 4.0 | 204 | 0 | 170 |
| JULY | | | | | | | | | | | | |
| 21... | 1200 | 11800 | 18.5 | 7.0 | 10 | 53 | 22 | 47 | 4.4 | 199 | 0 | 160 |
| AUG. | | | | | | | | | | | | |
| 25... | 1200 | 9280 | 16.5 | 8.0 | 10 | 58 | 21 | 49 | 3.7 | 203 | 0 | 160 |
| SEP. | | | | | | | | | | | | |
| 21... | 1400 | 9400 | 11.0 | 8.1 | 10 | 58 | 22 | 45 | 3.9 | 199 | 0 | 160 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 21... | 1330 | 14300 | 432 | .00 | -- | .20 | .8 |
| NOV. | | | | | | | |
| 24... | 1330 | 10000 | 440 | .03 | -- | .13 | 1.4 |
| DEC. | | | | | | | |
| 21... | 1300 | 10000 | 458 | .02 | -- | .48 | 2.2 |
| JAN. | | | | | | | |
| 19... | 1200 | 15500 | 438 | -- | .01 | -- | .6 |
| FEB. | | | | | | | |
| 22... | 1330 | 18000 | 408 | .13 | .00 | -- | .8 |
| MAR. | | | | | | | |
| 24... | 1000 | 14000 | 424 | .01 | .06 | .20 | 1.1 |
| APR. | | | | | | | |
| 21... | 1300 | 16500 | 494 | .07 | .09 | .26 | 1.2 |
| MAY | | | | | | | |
| 21... | 1600 | 14400 | 440 | .10 | .09 | .12 | .6 |
| JUNE | | | | | | | |
| 22... | 1400 | 12900 | 442 | .00 | .06 | .10 | 1.0 |
| JULY | | | | | | | |
| 21... | 1200 | 11800 | 422 | .19 | .09 | .12 | .7 |
| AUG. | | | | | | | |
| 25... | 1200 | 9280 | 406 | .07 | .06 | .10 | .4 |
| SEP. | | | | | | | |
| 21... | 1400 | 9400 | 392 | .13 | .03 | .090 | 1.9 |

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.--Continued

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 765 micromhos Dec. 10; minimum daily, 455 micromhos Jan. 3.
Water temperatures: Maximum, 20.0°C Aug. 7-9; minimum, freezing point on many days during November to March.

Period of record:
Specific conductance: Maximum daily, 807 micromhos May 10, 1970; minimum daily, 338 micromhos Mar. 30, 1967.
Water temperatures: Maximum observed, 24.5°C July 17, 1966; minimum, freezing point on many days during winter periods.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 21... | 9.1 | .7 | -- | 30 | 416 | .59 | 16700 | 240 | 74 | 1.5 | -- | -- |
| NOV. | | | | | | | | | | | | |
| 24... | 11 | .8 | -- | 130 | 443 | .60 | 11900 | 240 | 76 | 1.6 | 654 | 8.2 |
| DEC. | | | | | | | | | | | | |
| 21... | 9.0 | .7 | -- | 110 | 435 | .62 | 12400 | 240 | 86 | 1.4 | 671 | -- |
| JAN. | | | | | | | | | | | | |
| 19... | 7.5 | .7 | .00 | 100 | 410 | .60 | 18300 | 240 | 69 | 1.4 | 671 | -- |
| FEB. | | | | | | | | | | | | |
| 22... | 8.1 | .8 | .10 | -- | 370 | .55 | 19800 | 220 | 64 | 1.4 | 615 | -- |
| MAR. | | | | | | | | | | | | |
| 24... | 7.0 | .9 | .10 | -- | 391 | .53 | 16000 | 230 | 65 | 1.5 | 596 | 7.9 |
| APR. | | | | | | | | | | | | |
| 21... | 9.4 | .2 | .00 | 120 | 469 | .67 | 22000 | 200 | 63 | 2.4 | 733 | 7.1 |
| MAY | | | | | | | | | | | | |
| 21... | 9.3 | .6 | .00 | -- | 401 | .55 | 17100 | 250 | 89 | 1.1 | 665 | 7.9 |
| JUNE | | | | | | | | | | | | |
| 22... | 9.8 | .6 | .04 | -- | 420 | .60 | 15400 | 230 | 62 | 1.5 | 663 | 8.3 |
| JULY | | | | | | | | | | | | |
| 21... | 9.4 | .9 | .01 | 110 | 402 | .57 | 13400 | 220 | 60 | 1.4 | 643 | 8.1 |
| AUG. | | | | | | | | | | | | |
| 25... | 7.5 | .8 | .06 | -- | 408 | .55 | 10200 | 230 | 65 | 1.4 | 609 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 21... | 9.3 | .6 | .07 | -- | 405 | .53 | 9950 | 240 | 72 | 1.3 | 632 | 8.1 |

MISSOURI RIVER MAIN STEM

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 21... | 1330 | 14300 | 0 | 0 | 1 | -- | 0 | -- |
| DEC. | | | | | | | | |
| 21... | 1300 | 10000 | -- | -- | -- | -- | -- | .00 |
| JAN. | | | | | | | | |
| 19... | 1200 | 15500 | 0 | 0 | 0 | 0 | 7 | .00 |
| FEB. | | | | | | | | |
| 22... | 1330 | 18000 | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | |
| 24... | 1000 | 14000 | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | |
| 21... | 1300 | 16500 | 0 | 10 | 0 | 0 | 3 | .00 |
| MAY | | | | | | | | |
| 21... | 1600 | 14400 | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | |
| 22... | 1400 | 12900 | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | |
| 21... | 1200 | 11800 | 5 | 0 | 0 | 0 | 3 | .00 |
| AUG. | | | | | | | | |
| 25... | 1200 | 9280 | -- | -- | -- | -- | -- | -- |
| SEP. | | | | | | | | |
| 21... | 1400 | 9400 | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 21... | 1330 | 14300 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 19... | 1200 | 15500 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 21... | 1300 | 16500 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 21... | 1200 | 11800 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

MISSOURI RIVER MAIN STEM

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 21... | 0 | 11 | .0 | 20 | 3 | 0 | 0 | 0 |
| DEC. | | | | | | | | |
| 21... | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | |
| 19... | 0 | 0 | .0 | 0 | 4 | 0 | 0 | 40 |
| FEB. | | | | | | | | |
| 22... | -- | 0 | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | |
| 24... | -- | 0 | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | |
| 21... | 0 | 0 | .1 | 5 | 26 | 40 | 0 | 3 |
| MAY | | | | | | | | |
| 21... | -- | 0 | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | |
| 22... | -- | 17 | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | |
| 21... | 1 | 0 | .1 | 14 | 2 | 0 | 0 | 10 |
| AUG. | | | | | | | | |
| 25... | -- | 0 | -- | -- | -- | -- | -- | -- |
| SEP. | | | | | | | | |
| 21... | -- | 0 | -- | -- | -- | -- | -- | -- |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 21... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | |
| 19... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | |
| 21... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | |
| 21... | .00 | .00 | -- | -- | -- | -- | .00 | .00 | .00 |

MISSOURI RIVER MAIN STEM

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. 21... | 1330 | 9.5 | 14.0 | 610 | 10.0 | 8.5 | 10 |
| NOV. 24... | 1330 | .0 | 8.5 | 650 | 11.8 | 8.4 | 0 |
| DEC. 21... | 1300 | .0 | -8.0 | -- | 12.6 | 8.4 | 3 |
| JAN. 19... | 1200 | .5 | -1.5 | 660 | 11.2 | 8.4 | 180 |
| FEB. 22... | 1330 | .0 | 5.0 | 600 | 11.6 | 8.2 | 14 |
| MAR. 24... | 1000 | .5 | 1.0 | 610 | 12.4 | 8.2 | 0 |
| APR. 21... | 1300 | 5.5 | 8.5 | 640 | 10.0 | 8.2 | 0 |
| MAY 21... | 1600 | 10.0 | 17.0 | 665 | 10.2 | 8.1 | 20 |
| JUNE 22... | 1400 | 18.0 | 31.0 | 660 | 8.6 | 8.4 | 25 |
| JULY 21... | 1200 | 18.5 | 29.0 | 640 | 8.8 | 8.2 | 56 |
| AUG. 25... | 1200 | 16.5 | 23.0 | 635 | 9.0 | 8.5 | 40 |
| SEP. 21... | 1400 | 11.0 | 10.0 | 635 | 10.6 | 8.5 | 8 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C) WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 659 | 656 | 692 | 573 | 657 | 614 | 613 | 700 | 630 | 667 | 650 | 634 |
| 2 | 648 | 663 | 680 | 538 | 659 | 601 | 615 | 692 | 657 | 665 | 658 | 624 |
| 3 | 646 | 674 | 682 | 455 | 659 | 596 | 615 | 686 | 666 | 665 | 648 | 622 |
| 4 | 646 | 674 | 694 | 576 | 647 | 633 | 617 | 676 | 657 | 667 | 654 | 621 |
| 5 | 646 | 665 | 697 | 673 | 647 | 618 | 629 | 676 | 654 | 667 | 648 | 610 |
| 6 | 646 | 669 | 720 | 647 | 647 | 614 | 615 | 684 | 654 | 667 | 647 | 619 |
| 7 | 641 | 663 | 713 | 598 | 644 | 618 | 615 | 686 | 654 | 667 | 640 | 624 |
| 8 | 648 | 650 | 708 | 671 | 648 | 611 | 603 | 684 | 647 | 667 | 631 | 629 |
| 9 | 648 | 648 | 694 | 658 | 657 | 618 | 600 | 670 | 652 | 667 | 633 | 646 |
| 10 | 646 | 649 | 765 | 629 | 659 | 618 | 578 | 672 | 642 | 654 | 631 | 629 |
| 11 | 659 | 649 | 667 | 631 | 659 | 614 | 575 | 670 | 647 | 654 | 631 | 626 |
| 12 | 661 | 650 | 667 | 574 | 657 | 627 | 566 | 672 | 652 | 659 | 632 | 635 |
| 13 | 649 | 648 | 677 | 610 | 653 | 608 | 579 | 681 | 662 | 664 | 631 | 633 |
| 14 | 641 | 642 | 678 | 623 | 646 | 575 | 602 | 669 | 653 | 667 | 627 | 626 |
| 15 | 646 | 649 | 664 | 673 | 643 | 542 | 614 | 669 | 642 | 659 | 622 | 630 |
| 16 | 659 | 649 | 654 | 561 | 639 | 557 | 614 | 657 | 652 | 659 | 623 | 624 |
| 17 | 655 | 650 | 658 | 661 | 643 | 550 | 640 | 662 | 652 | 659 | 631 | 624 |
| 18 | 662 | 675 | 667 | 585 | 647 | 568 | 645 | 662 | 667 | 659 | 627 | 626 |
| 19 | 664 | 669 | 667 | 595 | 675 | 583 | 643 | 667 | 669 | 659 | 635 | 626 |
| 20 | 651 | 650 | 658 | 618 | 644 | 579 | 666 | 656 | 666 | 653 | 633 | 622 |
| 21 | 648 | 646 | 638 | 602 | 633 | 587 | 672 | 654 | 656 | 651 | 633 | 621 |
| 22 | 651 | 650 | 650 | 674 | 633 | 606 | 674 | 656 | 654 | 650 | 631 | 624 |
| 23 | 661 | 656 | 650 | 608 | 644 | 614 | 689 | 654 | 656 | 650 | 631 | 620 |
| 24 | 659 | 721 | 612 | 608 | 660 | 635 | 704 | 654 | 654 | 644 | 631 | 625 |
| 25 | 661 | 677 | 590 | 632 | 647 | 648 | 706 | 667 | 662 | 651 | 640 | 626 |
| 26 | 651 | 664 | 538 | 633 | 647 | 633 | 704 | 656 | 662 | 653 | 635 | 625 |
| 27 | 655 | 677 | 546 | 648 | 657 | 627 | 708 | 654 | 662 | 653 | 623 | 624 |
| 28 | 655 | 675 | 626 | 704 | 644 | 627 | 708 | 656 | 656 | 651 | 627 | 622 |
| 29 | 661 | 707 | 594 | 627 | --- | 620 | 708 | 653 | 656 | 651 | 623 | 624 |
| 30 | 662 | 710 | 600 | 676 | --- | 627 | 708 | 654 | 656 | 651 | 627 | 624 |
| 31 | 662 | --- | 688 | 679 | --- | 489 | --- | 653 | --- | 651 | 632 | --- |
| MONTH | 653 | 664 | 659 | 621 | 650 | 602 | 641 | 668 | 655 | 658 | 634 | 626 |
| YEAR | 644 | | | | | | | | | | | |

06185500 MISSOURI RIVER NEAR CULBERTSON, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.5 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 8.0 | 10.5 | 14.5 | 16.0 | --- |
| 2 | 12.5 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 8.0 | 11.5 | 16.5 | 16.5 | --- |
| 3 | 12.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 9.0 | 12.5 | 18.5 | 17.0 | --- |
| 4 | 11.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 9.5 | 14.5 | 17.0 | 18.0 | --- |
| 5 | 12.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 10.0 | 15.0 | 17.0 | 19.0 | --- |
| 6 | 10.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 10.5 | 15.5 | 17.5 | 19.0 | --- |
| 7 | 9.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 11.0 | 14.5 | 17.0 | 20.0 | --- |
| 8 | 7.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 11.0 | 13.0 | 15.5 | 20.0 | --- |
| 9 | 6.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 12.0 | 13.0 | 16.0 | 20.0 | --- |
| 10 | 5.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 11.5 | 14.5 | 17.5 | 18.0 | --- |
| 11 | 6.5 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 11.0 | 15.5 | 17.5 | 18.0 | --- |
| 12 | 7.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 11.0 | 16.0 | 17.5 | 18.0 | --- |
| 13 | 7.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 12.0 | 18.0 | 16.5 | 18.5 | --- |
| 14 | 8.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 12.5 | 18.0 | 17.0 | 18.5 | --- |
| 15 | 8.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 12.0 | 17.0 | 17.0 | 19.5 | --- |
| 16 | 8.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.5 | 11.5 | 17.0 | 18.0 | 19.5 | --- |
| 17 | 9.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 11.0 | 16.5 | 18.0 | 18.5 | --- |
| 18 | 8.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 9.5 | 15.0 | 18.0 | 17.5 | --- |
| 19 | 8.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 9.0 | 15.5 | 18.0 | 17.5 | --- |
| 20 | 9.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.5 | 6.0 | 9.5 | 15.5 | 18.0 | 17.5 | --- |
| 21 | 9.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.5 | 5.5 | 10.0 | 16.5 | 18.0 | 18.5 | --- |
| 22 | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 5.0 | 10.0 | 17.5 | 17.0 | 18.0 | --- |
| 23 | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 9.5 | 17.5 | 18.0 | 18.5 | --- |
| 24 | 8.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 10.0 | 18.0 | 18.5 | 16.0 | --- |
| 25 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.5 | 11.0 | 18.5 | 17.5 | 16.5 | --- |
| 26 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 12.0 | 18.5 | 16.0 | 16.5 | --- |
| 27 | 6.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 6.0 | 13.0 | 17.5 | 16.5 | 17.0 | --- |
| 28 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 5.0 | 14.5 | 15.0 | 15.0 | 18.5 | --- |
| 29 | 5.0 | 0.0 | 0.0 | 0.0 | --- | 0.5 | 6.0 | 15.0 | 14.0 | 15.0 | 18.5 | --- |
| 30 | 4.0 | 0.0 | 0.0 | 0.0 | --- | 0.5 | 7.0 | 14.0 | 13.5 | 16.0 | 17.0 | --- |
| 31 | 5.0 | --- | 0.0 | 0.0 | --- | 0.5 | --- | 11.5 | --- | 16.0 | 16.5 | --- |
| MONTH | 8.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 11.0 | 15.5 | 17.0 | 18.0 | --- |
| YEAR | 7.0 | | | | | | | | | | | |

## 06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.

LOCATION.--Lat 45°35'50", long 110°33'55", in NE¼NW¼NW¼ sec.12, T.3 S., R.9 E., Park County, at gaging station at bridge on former U.S. Highway 89, 2 miles downstream from Suce Creek, 4 miles south of Livingston, and at mile 481.3.

DRAINAGE AREA.--3,551 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1969 to September 1971.
Water temperatures: October 1969 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 186 mg/l Dec. 20-31; minimum, 70 mg/l June 9-30.
Hardness: Maximum, 96 mg/l Jan. 1-31; minimum, 34 mg/l June 9-30.
Specific conductance: Maximum daily, 312 micromhos Jan. 7; minimum daily, 87 micromhos June 21, 22.

### CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 2390 | -- | 22 | -- | 23 | 6.9 | 17 | 4.5 | 104 | 0 | 27 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 1960 | -- | 22 | -- | 23 | 6.9 | 18 | 5.0 | 103 | 0 | 30 |
| DEC. | | | | | | | | | | | | |
| 01-19 | -- | 1680 | -- | 25 | -- | 23 | 8.7 | 19 | 4.9 | 105 | 0 | 35 |
| 20-31 | -- | 1590 | -- | 25 | -- | 24 | 8.1 | 20 | 5.3 | 111 | 0 | 36 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 1470 | -- | 27 | 100 | 26 | 7.6 | 20 | 5.0 | 110 | 0 | 29 |
| FEB. | | | | | | | | | | | | |
| 01-28 | -- | 1640 | -- | 25 | 20 | 22 | 6.5 | 19 | 4.8 | 105 | -- | 36 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 1570 | -- | 27 | 20 | 22 | 7.1 | 24 | 6.3 | 109 | -- | 32 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 1850 | -- | 24 | 30 | 20 | 7.0 | 19 | 4.3 | 101 | 4 | 33 |
| MAY | | | | | | | | | | | | |
| 01-07 | -- | 3550 | -- | 23 | 40 | 18 | 5.8 | 13 | 3.4 | 92 | 0 | 20 |
| 08-26 | -- | 7440 | -- | 20 | 30 | 14 | 4.6 | 7.7 | 2.4 | 71 | 0 | 5.8 |
| 27-31 | -- | 15700 | -- | 17 | 60 | 11 | 3.4 | 5.0 | 1.7 | 54 | 0 | 7.5 |
| JUNE | | | | | | | | | | | | |
| 01-08 | -- | 13900 | -- | 18 | 20 | 12 | 3.4 | 6.1 | 1.7 | 67 | 0 | 9.8 |
| 09-30 | -- | 22800 | -- | 16 | 30 | 9.2 | 2.7 | 5.4 | 1.5 | 52 | 0 | 7.0 |
| JULY | | | | | | | | | | | | |
| 01-22 | -- | 15000 | -- | 16 | 20 | 10 | 3.3 | 7.8 | 2.2 | 55 | 0 | 11 |
| 23-31 | -- | 9120 | -- | 17 | 20 | 14 | 4.0 | 10 | 2.5 | 69 | 0 | 14 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 5270 | -- | 18 | 10 | 14 | 4.5 | 12 | 2.4 | 76 | 0 | 26 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 3320 | -- | 20 | 0 | 19 | 6.3 | 14 | 3.1 | 94 | 0 | 29 |
| WTD. AVG. | -- | -- | -- | 19 | -- | 14 | 4.3 | 10 | 2.6 | 71 | 0 | 16 |
| TIME WTD. AVG. | -- | 5240 | -- | 22 | -- | 19 | 6.0 | 15 | 3.9 | 91 | 0 | 25 |
| TONS PER DAY | -- | -- | -- | 263 | -- | 196 | 61 | 142 | 37 | 1000 | 2 | 225 |

### ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1300 | 2300 | 6.5 | 21 | 40 | 21 | 6.9 | 17 | 4.3 | 97 | 0 | 29 |
| JAN., 1971 | | | | | | | | | | | | |
| 26... | 1600 | 1680 | -- | 26 | 160 | 21 | 5.9 | 19 | 5.0 | 102 | 0 | 24 |
| APR. | | | | | | | | | | | | |
| 26... | 1530 | 2150 | 8.0 | 26 | 50 | 23 | 6.6 | 18 | 5.6 | 95 | 2 | 26 |
| JULY | | | | | | | | | | | | |
| 27... | 1500 | 9060 | 17.0 | 16 | 20 | 11 | 4.0 | 12 | 2.1 | 71 | 0 | 15 |

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.--Continued

EXTREMES, 1970-71.--Continued
Water temperatures: Maximum observed, 20.5°C Aug. 4,7, 10; minimum, freezing point on several days during November to March.

Period of record:
Dissolved solids: Maximum, 197 mg/l Feb. 1-28, 1970; minimum, 70 mg/l June 15-30, 1970, June 9-30, 1971.
Hardness: Maximum, 96 mg/l Jan. 1-31, 1971; minimum, 34 mg/l June 9-30, 1971.
Specific conductance: Maximum daily, 398 micromhos Apr. 3, 1970; minimum daily, 87 micromhos June 23, 25, 1970, June 21, 22, 1971.
Water temperatures: Maximum observed, 21.0°C Aug. 6, 7, 11, 16, 1970; minimum, freezing point on several days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 8.8 | .5 | -- | -- | 162 | .22 | 1050 | 86 | 0 | .8 | 244 | 8.0 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 8.0 | 1.0 | -- | -- | 165 | .26 | 995 | 86 | 1 | .9 | 254 | 8.0 |
| DEC. | | | | | | | | | | | | |
| 01-19 | 10 | .8 | -- | -- | 178 | .24 | 812 | 93 | 7 | .9 | 279 | 8.0 |
| 20-31 | 11 | .9 | -- | -- | 186 | .25 | 798 | 93 | 2 | .9 | 278 | 8.0 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 11 | .9 | .10 | .00 | 180 | .24 | 714 | 96 | 6 | .9 | 277 | 8.5 |
| FEB. | | | | | | | | | | | | |
| 01-28 | 9.4 | .9 | .20 | .09 | 176 | .24 | 779 | 82 | 0 | .9 | 259 | 8.1 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 11 | .8 | .10 | .00 | 184 | .25 | 780 | 84 | 0 | 1.1 | 283 | 8.0 |
| APR. | | | | | | | | | | | | |
| 01-30 | 7.9 | .6 | .02 | .09 | 170 | .23 | 849 | 79 | 0 | .9 | 257 | 7.9 |
| MAY | | | | | | | | | | | | |
| 01-07 | 5.0 | .5 | .00 | .06 | 134 | .18 | 1280 | 69 | 0 | .7 | 204 | 7.5 |
| 08-26 | 2.9 | .4 | .00 | .06 | 93 | .13 | 1870 | 54 | 0 | .5 | 148 | 7.7 |
| 27-31 | 1.7 | .2 | .01 | .15 | 74 | .10 | 3140 | 41 | 0 | .3 | 107 | 7.7 |
| JUNE | | | | | | | | | | | | |
| 01-08 | 2.6 | .5 | .00 | .09 | 87 | .12 | 3270 | 44 | 0 | .4 | 121 | 7.7 |
| 09-30 | 1.9 | .6 | .02 | .09 | 70 | .10 | 4310 | 34 | 0 | .4 | 95 | 7.0 |
| JULY | | | | | | | | | | | | |
| 01-22 | 3.4 | .6 | .01 | .03 | 81 | .11 | 3280 | 39 | 0 | .5 | 122 | 7.6 |
| 23-31 | 4.9 | .6 | .06 | .03 | 101 | .14 | 2490 | 51 | 0 | .6 | 156 | 7.8 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 3.8 | .4 | .00 | .03 | 119 | .16 | 1690 | 53 | 0 | .7 | 172 | 7.7 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 7.1 | .6 | .01 | .03 | 145 | .20 | 1300 | 73 | 0 | .7 | 213 | 7.6 |
| WTD. AVG. | 4.4 | .6 | -- | -- | 105 | .15 | -- | 52 | 0 | .6 | 156 | 7.6 |
| TIME WTD. AVG. | 7.2 | .7 | -- | -- | 145 | .20 | -- | 72 | 1 | .8 | 219 | 7.9 |
| TONS PER DAY | 62 | 8.2 | -- | -- | 1490 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 8.6 | .8 | -- | -- | 159 | .21 | 981 | 81 | 2 | .8 | 247 | 7.9 |
| JAN., 1971 | | | | | | | | | | | | |
| 26... | 9.4 | .9 | .00 | .10 | 160 | .22 | 726 | 77 | 0 | .9 | 243 | 7.6 |
| APR. | | | | | | | | | | | | |
| 26... | 8.5 | .7 | .10 | .06 | 166 | -- | 964 | 85 | 3 | .9 | 247 | 8.4 |
| JULY | | | | | | | | | | | | |
| 27... | 4.9 | .6 | .05 | .15 | 101 | .14 | 2470 | 44 | 0 | .8 | 143 | 7.7 |

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 22... | 1300 | 2300 | .020 | -- | -- |
| NOV. | | | | | |
| 25... | 1135 | 2090 | .010 | -- | -- |
| DEC. | | | | | |
| 22... | 1630 | 1620 | .000 | -- | -- |
| JAN., 1971 | | | | | |
| 26... | 1600 | 1680 | .030 | 380 | 0 |
| FEB. | | | | | |
| 23... | 0950 | 1560 | .020 | -- | -- |
| MAR. | | | | | |
| 24... | 0845 | 1600 | .080 | -- | -- |
| APR. | | | | | |
| 26... | 1530 | 2150 | .020 | 200 | 110 |
| MAY | | | | | |
| 26... | 0755 | 7660 | .050 | -- | -- |
| JUNE | | | | | |
| 16... | 1045 | 23100 | .060 | -- | -- |
| JULY | | | | | |
| 27... | 1500 | 9060 | .060 | 140 | 0 |
| AUG. | | | | | |
| 25... | 1800 | 3980 | .070 | -- | -- |
| SEP. | | | | | |
| 21... | 1330 | 3030 | .060 | -- | -- |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 231 | 243 | 254 | 265 | 250 | 283 | 266 | 245 | 108 | 115 | 158 | 193 |
| 2 | 231 | 243 | 252 | 265 | 252 | 283 | 271 | 241 | 115 | 123 | 156 | 198 |
| 3 | 231 | 247 | 261 | 281 | 250 | 286 | 273 | 210 | 115 | 115 | 158 | 198 |
| 4 | 231 | 251 | 252 | 300 | 252 | 283 | 271 | 196 | 115 | 111 | 152 | 195 |
| 5 | 234 | 251 | 273 | 309 | 252 | 280 | 273 | 197 | 115 | 115 | 153 | 195 |
| 6 | 233 | 253 | 294 | 300 | 270 | 283 | 271 | 184 | 113 | 115 | 159 | 202 |
| 7 | 233 | 249 | 300 | 312 | 273 | 283 | 248 | 181 | 111 | 114 | 161 | 197 |
| 8 | 233 | 243 | 300 | 289 | 270 | 283 | 253 | 162 | 102 | 120 | 160 | 202 |
| 9 | 233 | 251 | 270 | 286 | 278 | 283 | 250 | 154 | 92 | 119 | 161 | 202 |
| 10 | 233 | 243 | 254 | 284 | 261 | 283 | 253 | 170 | 90 | 117 | 161 | 206 |
| 11 | 233 | 249 | 261 | 289 | 261 | 283 | 250 | 154 | 89 | 119 | 162 | 206 |
| 12 | 233 | 251 | 254 | 289 | 252 | 272 | 250 | 140 | 93 | 120 | 167 | 206 |
| 13 | 234 | 249 | 275 | 284 | 261 | 280 | 259 | 138 | 94 | 121 | 167 | 208 |
| 14 | 233 | 249 | 300 | 281 | 254 | 265 | 253 | 128 | 91 | 120 | 170 | 209 |
| 15 | 240 | 251 | 300 | 286 | 261 | 265 | 250 | 146 | 90 | 125 | 170 | 211 |
| 16 | 234 | 251 | 261 | 286 | 252 | 272 | 248 | 136 | 91 | 127 | 171 | 211 |
| 17 | 240 | 251 | 254 | 265 | 252 | 262 | 246 | 124 | 89 | 125 | 177 | 212 |
| 18 | 240 | 251 | 252 | 260 | 261 | 272 | 246 | 133 | 90 | 130 | 177 | 217 |
| 19 | 234 | 251 | 268 | 265 | 261 | 278 | 248 | 147 | 89 | 133 | 177 | 217 |
| 20 | 233 | 253 | 273 | 260 | 252 | 286 | 253 | 154 | 94 | 131 | 179 | 217 |
| 21 | 234 | 251 | 273 | 260 | 261 | 272 | 250 | 161 | 87 | 133 | 180 | 217 |
| 22 | 234 | 253 | 275 | 265 | 273 | 280 | 253 | 162 | 87 | 135 | 184 | 222 |
| 23 | 240 | 255 | 297 | 265 | 273 | 262 | 250 | 172 | 91 | 152 | 189 | 222 |
| 24 | 240 | 264 | 294 | 276 | 273 | 280 | 248 | 160 | 89 | 145 | 188 | 224 |
| 25 | 246 | 251 | 275 | 281 | 273 | 272 | 248 | 153 | 97 | 152 | 188 | 224 |
| 26 | 246 | 238 | 286 | 265 | 250 | 265 | 246 | 142 | 94 | 160 | 189 | 224 |
| 27 | 248 | 238 | 286 | 263 | 273 | 260 | 248 | 115 | 98 | 146 | 190 | 224 |
| 28 | 248 | 238 | 278 | 263 | 275 | 260 | 250 | 97 | 107 | 146 | 190 | 227 |
| 29 | 250 | 249 | 273 | 263 | --- | 262 | 248 | 101 | 108 | 146 | 190 | 229 |
| 30 | 246 | 253 | 273 | 263 | --- | 260 | 250 | 102 | 112 | 152 | 190 | 229 |
| 31 | 248 | --- | 273 | 263 | --- | 260 | --- | 109 | --- | 152 | 190 | --- |
| MONTH | 237 | 249 | 274 | 277 | 262 | 274 | 254 | 155 | 99 | 130 | 173 | 211 |
| YEAR | 216 | | | | | | | | | | | |

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.0 | 7.0 | 2.0 | 1.0 | 5.5 | 0.5 | 6.0 | 15.0 | 9.5 | 14.0 | 18.5 | 17.0 |
| 2 | 13.0 | 5.5 | 3.0 | 1.0 | 4.5 | 0.0 | 6.0 | 14.0 | 11.0 | 13.0 | 18.5 | 15.0 |
| 3 | 13.5 | 5.0 | 1.0 | 1.0 | 3.0 | 0.5 | 6.0 | 13.0 | 11.0 | 14.5 | 19.0 | 14.0 |
| 4 | 13.5 | 4.0 | 2.0 | 1.0 | 1.5 | 2.0 | 8.0 | 11.5 | 10.0 | 13.0 | 20.5 | 14.5 |
| 5 | 11.0 | 6.0 | 3.5 | 1.5 | 1.0 | 2.5 | 9.5 | 11.5 | 11.5 | 14.0 | 20.0 | 15.5 |
| 6 | 8.0 | 7.0 | 4.5 | 1.0 | 0.5 | 3.0 | 10.0 | 12.0 | 10.0 | 14.0 | 20.0 | 15.5 |
| 7 | 7.0 | 6.5 | 5.0 | 1.0 | 0.0 | 1.5 | 9.5 | 11.0 | 12.0 | 14.0 | 20.5 | 14.5 |
| 8 | 8.0 | 6.0 | 5.0 | 1.0 | 1.0 | 4.0 | 10.5 | 11.5 | 11.0 | 13.5 | 20.0 | 16.0 |
| 9 | 8.0 | 6.0 | 2.5 | 1.0 | 2.0 | 5.0 | 10.0 | 9.0 | 10.5 | 15.0 | 20.0 | 15.5 |
| 10 | 8.0 | 6.0 | 1.0 | 0.0 | 3.0 | 5.0 | 6.5 | 11.0 | 10.5 | 16.0 | 20.5 | 15.5 |
| 11 | 8.0 | 5.5 | 1.5 | 0.0 | 4.5 | 6.5 | 6.0 | 11.5 | 10.0 | 16.0 | 19.5 | 15.5 |
| 12 | 8.5 | 5.0 | 0.0 | 0.5 | 5.0 | 6.0 | 7.5 | 13.0 | 11.5 | 16.0 | 19.0 | 16.0 |
| 13 | 7.0 | 5.5 | 0.5 | 1.0 | 5.5 | 6.5 | 9.0 | 10.0 | 11.0 | 16.5 | 19.5 | 15.5 |
| 14 | 8.5 | 5.0 | 1.0 | 1.0 | 5.0 | 6.0 | 10.0 | 9.0 | 11.0 | 17.0 | 19.5 | 14.0 |
| 15 | 8.5 | 4.5 | 1.5 | 2.0 | 5.0 | 4.0 | 7.5 | 11.0 | 10.0 | 18.0 | 19.0 | 11.5 |
| 16 | 8.0 | 4.5 | 2.0 | 2.0 | 4.0 | 3.0 | 8.5 | 8.0 | 10.0 | 18.0 | 20.0 | 10.0 |
| 17 | 8.0 | 5.0 | 1.0 | 2.0 | 3.0 | 3.5 | 7.5 | 7.5 | 10.5 | 19.5 | 19.0 | 10.0 |
| 18 | 8.0 | 5.0 | 0.5 | 5.0 | 4.0 | 4.0 | 6.5 | 7.0 | 11.0 | 18.5 | 19.0 | 11.0 |
| 19 | 8.0 | 4.5 | 0.0 | --- | 3.5 | 5.0 | 7.5 | 9.5 | 11.5 | 19.0 | 19.5 | 11.0 |
| 20 | 9.0 | 4.0 | 1.0 | 6.0 | 3.0 | 6.0 | 7.0 | 10.0 | 14.0 | 18.0 | --- | 10.0 |
| 21 | 7.5 | 2.0 | 0.5 | 6.0 | 2.0 | 1.5 | 7.5 | 9.5 | 13.0 | 17.5 | 19.5 | 11.5 |
| 22 | 7.0 | 1.0 | 0.0 | 4.5 | 2.5 | 0.5 | 6.5 | 9.0 | 14.0 | 19.0 | 18.0 | 12.0 |
| 23 | 7.0 | 1.0 | 1.0 | 5.0 | 3.5 | 2.5 | 11.5 | 12.0 | 13.0 | 19.0 | 18.0 | 12.0 |
| 24 | 5.5 | 0.0 | 0.5 | 6.0 | 3.0 | 5.0 | 9.5 | 11.5 | 13.0 | 19.0 | 18.0 | 12.5 |
| 25 | 5.5 | 2.0 | 0.0 | 7.0 | 2.0 | 7.5 | 7.0 | 15.0 | 12.5 | 19.0 | 17.5 | 11.0 |
| 26 | 5.0 | 2.5 | 0.0 | 5.0 | 2.0 | 8.0 | 8.0 | 14.0 | 10.5 | 19.0 | 19.0 | 11.5 |
| 27 | 5.0 | 0.0 | 1.0 | 4.0 | 0.5 | 6.0 | 9.5 | 14.0 | 10.0 | 18.0 | 19.5 | 10.5 |
| 28 | 4.5 | 3.5 | 2.0 | 5.0 | 0.0 | 7.5 | 9.5 | 12.0 | 10.5 | 15.5 | 19.5 | 10.5 |
| 29 | 6.0 | 4.0 | 2.0 | 4.5 | --- | 8.0 | 11.5 | 8.5 | 11.0 | 17.0 | 17.0 | 9.0 |
| 30 | 6.0 | 5.0 | 2.0 | 4.5 | --- | 8.5 | 13.0 | 8.0 | 13.5 | 18.0 | 18.0 | 7.5 |
| 31 | 6.0 | --- | 2.0 | 4.0 | --- | 5.0 | --- | 9.0 | --- | 16.0 | 18.0 | --- |
| MONTH | 8.0 | 4.5 | 1.5 | 3.0 | 3.0 | 4.5 | 8.5 | 11.0 | 11.5 | 16.5 | 19.0 | 13.0 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06197500 BOULDER RIVER NEAR CONTACT, MONT.

LOCATION.--Lat 45°31'30", long 110°13'01", in SW¼SW¼SW¼ sec.35, T.3 S., R.12 E., Sweet Grass County, 0.7 mile downstream from Contact Creek, 3.7 miles upstream from gaging station and 11.1 miles southwest of McLeod.

DRAINAGE AREA.--226 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).
Water temperatures: March to September 1971.
Sediment records: March to September 1971.

### CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 21... | 1600 | 128 | 4.5 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| JUNE 17... | 1900 | 2890 | 12.0 | 400 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| SEP. 23... | 1430 | 155 | 8.0 | 100 | 8 | 0 | 0 | 10 | 0 | 0 | 0 | 2 |

### TEMPERATURE (°C) OF WATER, MARCH TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | --- | --- | --- | --- | 0.0 | 1.0 | 7.0 | 3.5 | 5.0 | --- | 9.0 |
| 2 | --- | --- | --- | --- | --- | 1.0 | 0.5 | 9.5 | 3.5 | 6.0 | --- | 13.0 |
| 3 | --- | --- | --- | --- | --- | 0.0 | 1.5 | 4.0 | 4.0 | 5.5 | 10.5 | 9.0 |
| 4 | --- | --- | --- | --- | --- | 0.0 | 1.0 | 4.5 | 3.5 | 4.0 | 10.5 | 7.0 |
| 5 | --- | --- | --- | --- | --- | 0.0 | 0.5 | 4.0 | 3.5 | 5.0 | 10.5 | --- |
| 6 | --- | --- | --- | --- | --- | 1.0 | 2.0 | 3.5 | 3.5 | 5.5 | 10.5 | 8.5 |
| 7 | --- | --- | --- | --- | --- | 1.0 | 2.5 | 4.0 | 4.0 | 5.5 | --- | --- |
| 8 | --- | --- | --- | --- | --- | 0.0 | 2.5 | 3.0 | 3.5 | 5.0 | --- | --- |
| 9 | --- | --- | --- | --- | --- | 0.0 | 3.0 | 4.5 | 3.5 | 5.0 | --- | 8.0 |
| 10 | --- | --- | --- | --- | --- | 1.0 | 4.0 | 3.0 | 4.0 | 5.0 | --- | 7.5 |
| 11 | --- | --- | --- | --- | --- | 2.0 | 6.0 | 3.0 | 4.0 | 6.0 | 10.0 | 10.0 |
| 12 | --- | --- | --- | --- | --- | 2.0 | 1.5 | --- | 3.5 | 6.0 | 10.0 | --- |
| 13 | --- | --- | --- | --- | --- | 3.0 | 1.0 | --- | 4.0 | 6.0 | 10.5 | --- |
| 14 | --- | --- | --- | --- | --- | 3.0 | 2.5 | --- | 4.5 | --- | --- | --- |
| 15 | --- | --- | --- | --- | --- | 4.0 | 5.0 | --- | 3.5 | 6.0 | 11.0 | 7.0 |
| 16 | --- | --- | --- | --- | --- | 3.0 | 2.5 | 4.5 | 4.0 | 7.0 | --- | --- |
| 17 | --- | --- | --- | --- | --- | --- | --- | 2.0 | 4.0 | 7.0 | 9.5 | 4.5 |
| 18 | --- | --- | --- | --- | --- | 2.0 | 2.5 | 2.0 | 3.5 | 8.0 | 10.5 | --- |
| 19 | --- | --- | --- | --- | --- | 2.0 | 3.0 | 3.5 | 4.0 | 8.0 | 10.5 | --- |
| 20 | --- | --- | --- | --- | --- | 1.0 | 4.0 | 3.0 | 4.5 | 8.5 | 10.5 | 3.5 |
| 21 | --- | --- | --- | --- | --- | 0.0 | 4.0 | 3.0 | 5.0 | 9.0 | --- | --- |
| 22 | --- | --- | --- | --- | --- | 1.0 | 4.0 | 3.5 | 5.0 | 8.5 | --- | --- |
| 23 | --- | --- | --- | --- | --- | 1.0 | 6.5 | 4.0 | 4.5 | 8.5 | --- | 3.5 |
| 24 | --- | --- | --- | --- | --- | 1.0 | 5.5 | 7.0 | 4.5 | 8.0 | --- | 5.5 |
| 25 | --- | --- | --- | --- | --- | 1.0 | 4.0 | 6.5 | 5.0 | --- | 13.5 | --- |
| 26 | --- | --- | --- | --- | --- | 2.0 | 5.0 | 4.0 | 5.0 | 8.0 | 11.0 | 6.0 |
| 27 | --- | --- | --- | --- | --- | 3.0 | 2.0 | 4.0 | 4.5 | 8.5 | 11.0 | 3.5 |
| 28 | --- | --- | --- | --- | --- | 2.0 | 4.0 | 3.5 | 4.0 | 8.5 | --- | 4.0 |
| 29 | --- | --- | --- | --- | --- | 2.0 | 4.0 | 3.5 | 4.0 | 8.5 | --- | --- |
| 30 | --- | --- | --- | --- | --- | 2.0 | 4.0 | 4.0 | 4.5 | 8.5 | 10.5 | 4.0 |
| 31 | --- | --- | --- | --- | --- | 1.0 | --- | 3.0 | --- | --- | 10.0 | --- |
| MONTH | --- | --- | --- | --- | --- | 1.5 | 3.0 | 4.0 | 4.0 | 7.0 | --- | --- |
| YEAR | 5.0 | | | | | | | | | | | |

06197500 BOULDER RIVER NEAR CONTACT, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum observed, 13.5°C Aug. 25; minimum, freezing point on several days during March.
Sediment concentrations: Maximum daily, 139 mg/l June 23; minimum daily, 1 mg/l on many days during March, April, August and September.
Sediment discharge: Maximum daily, 1,740 tons June 23; minimum daily, 0.14 ton Mar. 22.

REMARKS.--Flow affected by ice on several days during March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 21... | 20 | 0 | 3.3 | 0 | .0 | 0 | 3 | 0 | -- | 140 | -- | -- |
| JUNE 17... | 40 | 4 | 1.6 | 20 | .3 | 0 | 1 | 4 | 0 | 70 | .2 | 10 |
| SEP. 23... | 30 | 0 | 3.2 | 0 | .0 | 2 | 4 | 4 | 0 | 140 | .0 | 10 |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUNE 24... | 1100 | 7.0 | 4000 | 223 | 2410 | 15 | 35 | 64 | 80 | 90 | 100 |

06197500 BOULDER RIVER NEAR CONTACT, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, MARCH TO SEPTEMBER 1971

| DAY | OCTOBER MEAN DISCHARGE (CFS) | OCTOBER MEAN CONCEN-TRATION (MG/L) | OCTOBER SEDIMENT DISCHARGE (TONS/DAY) | NOVEMBER MEAN DISCHARGE (CFS) | NOVEMBER MEAN CONCEN-TRATION (MG/L) | NOVEMBER SEDIMENT DISCHARGE (TONS/DAY) | DECEMBER MEAN DISCHARGE (CFS) | DECEMBER MEAN CONCEN-TRATION (MG/L) | DECEMBER SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOTAL | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DAY | JANUARY MEAN DISCHARGE (CFS) | JANUARY MEAN CONCEN-TRATION (MG/L) | JANUARY SEDIMENT DISCHARGE (TONS/DAY) | FEBRUARY MEAN DISCHARGE (CFS) | FEBRUARY MEAN CONCEN-TRATION (MG/L) | FEBRUARY SEDIMENT DISCHARGE (TONS/DAY) | MARCH MEAN DISCHARGE (CFS) | MARCH MEAN CONCEN-TRATION (MG/L) | MARCH SEDIMENT DISCHARGE (TONS/DAY) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | -- | -- | -- | -- | -- | 56 | 2 | .30 |
| 2 | -- | -- | -- | -- | -- | -- | 54 | 1 | .15 |
| 3 | -- | -- | -- | -- | -- | -- | 58 | 1 | .16 |
| 4 | -- | -- | -- | -- | -- | -- | 64 | 1 | .17 |
| 5 | -- | -- | -- | -- | -- | -- | 60 | 1 | .16 |
| 6 | -- | -- | -- | -- | -- | -- | 60 | 6 | .97 |
| 7 | -- | -- | -- | -- | -- | -- | 60 | 1 | .16 |
| 8 | -- | -- | -- | -- | -- | -- | 62 | 1 | .17 |
| 9 | -- | -- | -- | -- | -- | -- | 62 | 1 | .17 |
| 10 | -- | -- | -- | -- | -- | -- | 62 | 9 | 1.5 |
| 11 | -- | -- | -- | -- | -- | -- | 62 | 5 | .84 |
| 12 | -- | -- | -- | -- | -- | -- | 62 | 1 | .17 |
| 13 | -- | -- | -- | -- | -- | -- | 67 | 1 | .18 |
| 14 | -- | -- | -- | -- | -- | -- | 62 | 2 | .33 |
| 15 | -- | -- | -- | -- | -- | -- | 60 | 1 | .16 |
| 16 | -- | -- | -- | -- | -- | -- | 59 | 1 | .16 |
| 17 | -- | -- | -- | -- | -- | -- | 56 | 1 | .15 |
| 18 | -- | -- | -- | -- | -- | -- | 56 | 1 | .15 |
| 19 | -- | -- | -- | -- | -- | -- | 57 | 10 | 1.5 |
| 20 | -- | -- | -- | -- | -- | -- | 64 | 1 | .17 |
| 21 | -- | -- | -- | -- | -- | -- | 60 | 3 | .49 |
| 22 | -- | -- | -- | -- | -- | -- | 53 | 1 | .14 |
| 23 | -- | -- | -- | -- | -- | -- | 60 | 2 | .32 |
| 24 | -- | -- | -- | -- | -- | -- | 62 | 1 | .17 |
| 25 | -- | -- | -- | -- | -- | -- | 60 | 1 | .16 |
| 26 | -- | -- | -- | -- | -- | -- | 62 | 2 | .33 |
| 27 | -- | -- | -- | -- | -- | -- | 67 | 1 | .18 |
| 28 | -- | -- | -- | -- | -- | -- | 62 | 1 | .17 |
| 29 | -- | -- | -- | -- | -- | -- | 60 | 3 | .49 |
| 30 | -- | -- | -- | -- | -- | -- | 66 | 3 | .53 |
| 31 | -- | -- | -- | -- | -- | -- | 69 | 1 | .19 |
| TOTAL | -- | -- | -- | -- | -- | -- | 1884 | -- | 10.89 |

06197500 BOULDER RIVER NEAR CONTACT, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, MARCH TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 60 | 1 | .16 | 117 | 7 | 2.2 | 1160 | 11 | 34 |
| 2 | 57 | 2 | .31 | 155 | 3 | 1.3 | 1040 | 13 | 37 |
| 3 | 60 | 1 | .16 | 222 | 5 | 3.0 | 1100 | 19 | 56 |
| 4 | 57 | 1 | .15 | 265 | 6 | 4.3 | 1150 | 21 | 65 |
| 5 | 60 | 3 | .49 | 310 | 9 | 7.5 | 1200 | 12 | 39 |
| 6 | 69 | 2 | .37 | 360 | 11 | 11 | 1360 | 17 | 62 |
| 7 | 72 | 1 | .19 | 404 | 11 | 12 | 1340 | 18 | 65 |
| 8 | 79 | 1 | .21 | 482 | 15 | 20 | 1790 | 31 | 150 |
| 9 | 76 | 1 | .21 | 482 | 6 | 7.8 | 2320 | 61 | 382 |
| 10 | 87 | 1 | .23 | 442 | 5 | 6.0 | 2610 | 81 | 571 |
| 11 | 79 | 1 | .21 | 494 | 9 | 12 | 2770 | 102 | 763 |
| 12 | 78 | 1 | .21 | 610 | 26 | 43 | 2490 | 35 | 235 |
| 13 | 69 | 2 | .37 | 776 | 32 | 67 | 2700 | 31 | 226 |
| 14 | 78 | 1 | .21 | 812 | 23 | 50 | 2820 | 42 | 320 |
| 15 | 94 | 2 | .51 | 707 | 7 | 13 | 2990 | 56 | 452 |
| 16 | 100 | 3 | .81 | 828 | 6 | 13 | 2770 | 36 | 269 |
| 17 | 94 | 2 | .51 | 741 | 14 | 28 | 3180 | 70 | 601 |
| 18 | 90 | 1 | .24 | 622 | 3 | 5.0 | 2880 | 46 | 358 |
| 19 | 85 | 1 | .23 | 530 | 3 | 4.3 | 3200 | 48 | 415 |
| 20 | 85 | 2 | .46 | 500 | 2 | 2.7 | 2930 | 40 | 316 |
| 21 | 85 | 1 | .23 | 459 | 6 | 7.4 | 3570 | 72 | 694 |
| 22 | 92 | 2 | .50 | 426 | 15 | 17 | 4240 | 112 | 1280 |
| 23 | 92 | 11 | 2.7 | 388 | 3 | 3.1 | 4640 | 139 | 1740 |
| 24 | 98 | 3 | .79 | 415 | 2 | 2.2 | 4210 | 127 | 1440 |
| 25 | 142 | 2 | .77 | 494 | 5 | 6.7 | 3760 | 102 | 1040 |
| 26 | 122 | 3 | .99 | 720 | 17 | 33 | 3390 | 70 | 641 |
| 27 | 109 | 2 | .59 | 1140 | 83 | 255 | 3490 | 73 | 688 |
| 28 | 107 | 1 | .29 | 1610 | 89 | 387 | 2630 | 50 | 355 |
| 29 | 107 | 1 | .29 | 1990 | 69 | 371 | 1990 | 42 | 226 |
| 30 | 107 | 2 | .58 | 1560 | 23 | 97 | 1590 | 29 | 124 |
| 31 | -- | -- | -- | 1260 | 14 | 48 | -- | -- | -- |
| TOTAL | 2590 | -- | 13.97 | 20321 | -- | 1540.5 | 77310 | -- | 13644 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1570 | 21 | 89 | 554 | 2 | 3.0 | 233 | 2 | 1.3 |
| 2 | 1820 | 30 | 147 | 542 | 2 | 2.9 | 214 | 1 | .58 |
| 3 | 2480 | 69 | 462 | 548 | 14 | 21 | 241 | 2 | 1.3 |
| 4 | 2170 | 35 | 205 | 629 | 114 | 194 | 288 | 2 | 1.6 |
| 5 | 1900 | 25 | 128 | 572 | 7 | 11 | 274 | 2 | 1.5 |
| 6 | 1960 | 25 | 132 | 566 | 32 | 49 | 265 | 2 | 1.4 |
| 7 | 1990 | 22 | 118 | 578 | 45 | 70 | 278 | 2 | 1.5 |
| 8 | 1700 | 13 | 60 | 542 | 10 | 15 | 288 | 2 | 1.6 |
| 9 | 1590 | 12 | 52 | 494 | 6 | 8.0 | 245 | 2 | 1.3 |
| 10 | 1770 | 15 | 72 | 454 | 4 | 4.9 | 225 | 2 | 1.2 |
| 11 | 1810 | 16 | 78 | 420 | 2 | 2.3 | 208 | 2 | 1.1 |
| 12 | 1620 | 11 | 48 | 398 | 2 | 2.1 | 200 | 2 | 1.1 |
| 13 | 1540 | 9 | 37 | 371 | 2 | 2.0 | 190 | 2 | 1.0 |
| 14 | 1470 | 10 | 40 | 350 | 2 | 1.9 | 184 | 2 | .99 |
| 15 | 1420 | 11 | 42 | 340 | 2 | 1.8 | 181 | 2 | .98 |
| 16 | 1380 | 10 | 37 | 340 | 2 | 1.8 | 181 | 1 | .49 |
| 17 | 1410 | 8 | 30 | 325 | 1 | .88 | 181 | 1 | .49 |
| 18 | 1400 | 6 | 23 | 315 | 2 | 1.7 | 172 | 1 | .46 |
| 19 | 1260 | 6 | 20 | 296 | 2 | 1.6 | 175 | 2 | .95 |
| 20 | 1110 | 6 | 18 | 278 | 2 | 1.5 | 169 | 2 | .91 |
| 21 | 1080 | 9 | 26 | 265 | 2 | 1.4 | 160 | 2 | .86 |
| 22 | 1000 | 8 | 22 | 253 | 2 | 1.4 | 158 | 1 | .43 |
| 23 | 948 | 4 | 10 | 245 | 2 | 1.3 | 155 | 1 | .42 |
| 24 | 895 | 4 | 9.7 | 237 | 2 | 1.3 | 150 | 1 | .41 |
| 25 | 880 | 5 | 12 | 222 | 1 | .60 | 145 | 1 | .39 |
| 26 | 769 | 7 | 15 | 214 | 1 | .58 | 148 | 1 | .40 |
| 27 | 714 | 4 | 7.7 | 208 | 2 | 1.1 | 145 | 1 | .39 |
| 28 | 674 | 3 | 5.5 | 204 | 2 | 1.1 | 140 | 1 | .38 |
| 29 | 636 | 4 | 6.9 | 222 | 2 | 1.2 | 140 | 1 | .38 |
| 30 | 603 | 3 | 4.9 | 301 | 2 | 1.6 | 142 | 1 | .38 |
| 31 | 590 | 2 | 3.2 | 261 | 7 | 4.9 | -- | -- | -- |
| TOTAL | 42159 | -- | 1960.9 | 11544 | -- | 412.86 | 5875 | -- | 26.19 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 162219
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 17609.31

## 06202610 STILLWATER RIVER AT BEEHIVE, MONT.

LOCATION.--Lat 45°28'40", long 109°43'36", in NE¼NE¼NE¼ sec.22, T.4 S., R.16 E., Stillwater County, on private bridge 0.4 mile west of Beehive, 1.7 miles downstream from Magpie Creek and 4.5 miles northeast of Nye.

DRAINAGE AREA.--360 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971.
Water temperatures: October 1970 to September 1971.
Sediment records: October 1970 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 05... | 1700 | 234 | -- | 6.9 | 0 | 20 | 6.3 | 3.4 | 1.0 | 73 | 0 | 19 |
| NOV. | | | | | | | | | | | | |
| 12... | 1700 | 159 | 3.5 | 9.0 | 20 | 22 | 7.0 | 3.9 | .6 | 87 | 0 | 23 |
| DEC. | | | | | | | | | | | | |
| 10... | 1230 | 129 | .0 | 9.6 | 30 | 24 | 8.0 | 3.9 | 1.1 | 97 | 0 | 24 |
| JAN. | | | | | | | | | | | | |
| 12... | 1130 | 99 | .0 | 13 | 110 | 22 | 7.9 | 3.9 | .9 | 93 | 0 | 23 |
| FEB. | | | | | | | | | | | | |
| 10... | 1230 | 119 | .5 | 8.7 | 100 | 22 | 6.1 | 3.6 | 1.0 | 92 | 0 | 13 |
| MAR. | | | | | | | | | | | | |
| 10... | 1130 | 87 | 1.5 | 9.1 | 80 | 24 | 7.9 | 4.3 | 1.0 | 102 | 0 | 21 |
| APR. | | | | | | | | | | | | |
| 12... | 1015 | 83 | 3.5 | 8.9 | 30 | 23 | 8.0 | 3.9 | 1.2 | 84 | -- | 22 |
| MAY | | | | | | | | | | | | |
| 11... | 1000 | 562 | -- | 7.6 | 60 | 13 | 4.0 | 2.3 | 2.9 | 51 | -- | 12 |
| JUNE | | | | | | | | | | | | |
| 10... | 1700 | 3350 | 8.5 | 5.3 | 70 | 7.4 | 2.2 | 1.0 | .3 | 33 | 0 | 7.0 |
| JULY | | | | | | | | | | | | |
| 08... | 1000 | 2060 | 6.0 | 5.1 | 20 | 6.8 | 2.3 | 1.0 | .6 | 29 | 0 | 4.5 |
| AUG. | | | | | | | | | | | | |
| 17... | 1000 | 530 | -- | 6.5 | 20 | 13 | 3.7 | 2.1 | .8 | 56 | 0 | 8.5 |
| SEP. | | | | | | | | | | | | |
| 08... | 0930 | 522 | 8.0 | 6.5 | 20 | 12 | 3.9 | 2.2 | .8 | 54 | 0 | 8.3 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 05... | 1700 | 234 | 0 | 0 | -- |
| NOV. | | | | | |
| 12... | 1700 | 159 | 10 | -- | -- |
| DEC. | | | | | |
| 10... | 1230 | 129 | 10 | -- | -- |
| JAN. | | | | | |
| 12... | 1130 | 99 | 20 | 0 | .00 |
| FEB. | | | | | |
| 10... | 1230 | 119 | -- | 100 | -- |
| MAR. | | | | | |
| 10... | 1130 | 87 | -- | 10 | -- |
| APR. | | | | | |
| 12... | 1015 | 83 | 20 | 0 | .00 |
| MAY | | | | | |
| 11... | 1000 | 562 | -- | 51 | -- |
| JUNE | | | | | |
| 10... | 1700 | 3350 | -- | 0 | -- |
| JULY | | | | | |
| 08... | 1000 | 2060 | -- | 54 | -- |
| AUG. | | | | | |
| 17... | 1000 | 530 | -- | 20 | -- |
| SEP. | | | | | |
| 08... | 0930 | 522 | -- | 0 | -- |

06202610 STILLWATER RIVER AT BEEHIVE, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 19.5°C Aug. 27; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 146 mg/l June 10; minimum daily, 1 mg/l on many days during October to May, August and September.
Sediment discharge: Maximum daily, 1,360 tons June 23; minimum daily, 0.19 ton Apr. 5.

REMARKS.--Records of discharge are given for station 06202600, Stillwater River at Nye. Flow affected by ice during most of winter months.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 05... | 1.2 | .2 | -- | -- | 94 | .05 | 24.0 | 76 | 16 | .2 | 166 | 8.1 |
| NOV. | | | | | | | | | | | | |
| 12... | 1.0 | .0 | -- | -- | 109 | .16 | 49.8 | 84 | 12 | .2 | 185 | 7.8 |
| DEC. | | | | | | | | | | | | |
| 10... | 1.6 | .1 | -- | -- | 120 | .17 | 42.8 | 93 | 13 | .2 | 202 | -- |
| JAN. | | | | | | | | | | | | |
| 12... | .6 | .2 | .10 | .03 | 120 | .16 | 32.1 | 88 | 12 | .2 | 196 | 7.5 |
| FEB. | | | | | | | | | | | | |
| 10... | .9 | .2 | .00 | .00 | 100 | .14 | 32.1 | 80 | 5 | .2 | 174 | 7.9 |
| MAR. | | | | | | | | | | | | |
| 10... | .5 | .1 | .10 | .00 | 120 | .16 | 28.3 | 92 | 8 | .2 | 205 | 8.1 |
| APR. | | | | | | | | | | | | |
| 12... | 1.2 | .1 | .20 | .03 | 112 | .15 | 25.1 | 90 | 21 | .2 | 186 | 7.9 |
| MAY | | | | | | | | | | | | |
| 11... | .9 | .3 | .10 | .06 | 69 | .09 | 105 | 49 | 7 | .1 | 106 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 10... | .3 | .0 | .06 | .00 | 40 | .05 | 362 | 28 | 0 | .1 | 57 | 8.0 |
| JULY | | | | | | | | | | | | |
| 08... | 1.3 | .1 | .02 | .03 | 36 | .05 | 200 | 26 | 3 | .1 | 61 | 7.4 |
| AUG. | | | | | | | | | | | | |
| 17... | .4 | .5 | .06 | .00 | 63 | .09 | 90.2 | 48 | 2 | .1 | 99 | 7.2 |
| SEP. | | | | | | | | | | | | |
| 08... | 1.0 | .5 | .22 | .00 | 63 | .09 | 88.8 | 46 | 2 | .1 | 106 | 7.6 |

06202610 STILLWATER RIVER AT BEEHIVE, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 05... | 1700 | 234 | -- | 100 | -- | -- | -- | -- | 0 | 0 |
| JAN. 12... | 1130 | 99 | .0 | 100 | 0 | 0 | 0 | 0 | 1 | 2 |
| APR. 12... | 1015 | 83 | 3.5 | 500 | 0 | 100 | 0 | 1 | 1 | 0 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | ALKA-LINITY AS CACO3 (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. 05... | 1700 | 13.0 | 17.5 | 160 | 9.2 | 8.4 | 62 |
| NOV. 12... | 1700 | 3.5 | 5.0 | -- | 11.4 | 7.7 | 72 |
| DEC. 10... | 1230 | .0 | -3.0 | -- | 12.1 | 7.8 | 74 |
| JAN. 12... | 1130 | .0 | -24.0 | -- | 11.0 | 7.5 | 74 |
| FEB. 10... | 1230 | .5 | 6.0 | -- | 12.6 | 7.8 | 73 |
| MAR. 10... | 1130 | 1.5 | 9.0 | -- | 10.2 | 7.8 | 79 |
| APR. 12... | 1015 | 3.5 | 2.5 | -- | 8.8 | -- | -- |
| MAY 11... | 1000 | 5.0 | 14.0 | -- | 9.4 | 8.0 | 41 |
| JUNE 10... | 1700 | 8.5 | 16.5 | -- | 9.6 | -- | -- |
| JULY 08... | 1000 | 6.0 | 18.0 | -- | 8.8 | 7.2 | 40 |
| AUG. 17... | 1000 | 12.0 | 23.0 | -- | 9.2 | 7.0 | 42 |
| SEP. 08... | 0930 | 8.0 | 14.0 | -- | 8.8 | 8.0 | 46 |

06202610 STILLWATER RIVER AT BEEHIVE, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 05... | 17 | 0 | .0 | 7 | 0 | 0 | -- | 130 | -- | -- |
| JAN. | | | | | | | | | | |
| 12... | 1 | 0 | -- | -- | 0 | 0 | 1 | 100 | .0 | 10 |
| APR. | | | | | | | | | | |
| 12... | 4 | 5 | .1 | 0 | 9 | 30 | 1 | 350 | .0 | 30 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.0 | 4.5 | 1.5 | 0.5 | 0.0 | 0.0 | 8.5 | 14.5 | 8.5 | 9.0 | 14.0 | 15.5 |
| 2 | 12.5 | 4.0 | 2.0 | 0.5 | 2.0 | 0.0 | 7.0 | 15.0 | 11.0 | 11.0 | --- | 14.5 |
| 3 | 6.5 | 4.0 | 0.0 | 0.0 | 1.0 | 0.0 | 6.0 | 12.5 | 10.0 | 8.5 | 17.0 | 11.5 |
| 4 | 11.5 | 4.0 | 0.5 | 0.0 | 1.5 | 0.5 | 3.0 | 11.5 | 10.5 | 8.0 | 18.0 | 9.0 |
| 5 | 12.0 | 5.5 | 1.0 | 0.0 | 0.5 | 0.0 | 11.5 | 11.0 | 11.0 | 11.0 | 19.0 | 11.5 |
| 6 | 6.5 | 6.0 | --- | 0.0 | 1.0 | 0.5 | 11.0 | 8.5 | 8.5 | 14.0 | 14.0 | 12.0 |
| 7 | 7.0 | 5.0 | --- | 0.5 | 0.5 | 0.5 | 12.0 | 9.0 | 11.5 | 11.5 | 18.0 | 12.0 |
| 8 | 8.0 | 5.0 | --- | 0.0 | 2.0 | 4.5 | 11.5 | 10.5 | 9.5 | 11.5 | 18.5 | --- |
| 9 | 6.5 | 5.5 | 1.0 | 0.0 | 1.5 | 2.5 | 11.5 | 6.5 | 5.0 | 12.5 | 18.0 | --- |
| 10 | 5.0 | 5.0 | 0.0 | 0.0 | 3.0 | 4.5 | 8.5 | 11.0 | 6.5 | 12.0 | 15.5 | --- |
| 11 | 5.5 | 4.0 | 0.5 | 0.0 | 3.0 | 6.0 | 8.5 | 12.0 | 6.5 | 13.0 | 15.0 | --- |
| 12 | 6.5 | 4.5 | 0.0 | 0.0 | 3.0 | 8.0 | 9.0 | 12.5 | 6.5 | 14.0 | 14.5 | --- |
| 13 | 4.0 | 4.5 | 0.0 | 0.0 | 5.0 | --- | 10.0 | 11.0 | 6.5 | 13.0 | 16.0 | --- |
| 14 | 6.0 | 5.0 | 0.0 | 0.0 | 4.0 | --- | 11.5 | 10.5 | 6.0 | 14.0 | 17.0 | --- |
| 15 | 7.0 | 5.0 | 0.0 | 0.5 | 4.5 | --- | 8.0 | 10.5 | 5.0 | 16.5 | --- | 9.0 |
| 16 | 7.5 | 4.5 | 2.0 | 0.0 | 3.0 | --- | 4.5 | 10.5 | 6.0 | 12.5 | 17.0 | 7.5 |
| 17 | 7.5 | 4.0 | 0.0 | 3.0 | 1.0 | 2.5 | 6.5 | 6.0 | 5.5 | 13.5 | 16.5 | 7.0 |
| 18 | 7.5 | 3.0 | 0.0 | 1.0 | 4.0 | 3.5 | 5.5 | 8.0 | 5.0 | 15.0 | 17.0 | 4.0 |
| 19 | 7.5 | 3.5 | 0.0 | 3.0 | 1.0 | 4.0 | 7.0 | 9.0 | 5.5 | 15.5 | 17.0 | 11.0 |
| 20 | 7.0 | 3.0 | 0.0 | 1.0 | 3.0 | 2.0 | 6.0 | 9.0 | 6.0 | 11.0 | 17.5 | 7.0 |
| 21 | 6.5 | 0.0 | 1.0 | 1.0 | 1.0 | 0.5 | 8.0 | 8.0 | 6.5 | 14.5 | 17.0 | 10.0 |
| 22 | 7.0 | 0.0 | 0.0 | 1.0 | 0.5 | 1.0 | 8.0 | 6.0 | 7.0 | 15.5 | 17.0 | 11.0 |
| 23 | 6.0 | 0.0 | 0.0 | 1.0 | 1.0 | 3.0 | 8.0 | 8.0 | --- | 16.5 | 11.5 | 13.0 |
| 24 | 5.5 | 4.5 | 0.5 | 1.0 | 2.0 | 5.0 | 8.5 | 11.0 | 5.5 | 17.0 | 16.5 | 13.0 |
| 25 | 4.5 | 1.0 | 0.0 | 1.0 | 1.5 | 5.5 | 3.5 | 13.0 | 7.0 | 12.5 | 11.0 | 12.0 |
| 26 | 4.0 | 1.0 | 0.5 | 3.0 | 0.0 | 7.0 | 6.0 | 13.5 | 6.5 | 13.0 | 17.0 | 15.0 |
| 27 | 3.0 | 0.5 | 0.0 | 2.5 | 0.0 | 6.0 | 7.0 | 11.0 | 6.0 | 17.0 | 19.5 | 12.0 |
| 28 | 3.5 | 2.0 | 1.0 | 3.0 | 0.0 | 7.0 | 9.0 | 9.0 | 6.0 | 11.5 | 13.0 | 10.0 |
| 29 | 3.5 | 4.0 | 1.0 | 4.5 | --- | 7.5 | 10.5 | 5.5 | 6.0 | 13.0 | 14.0 | 10.0 |
| 30 | 6.5 | 4.0 | 2.0 | 1.0 | --- | 10.5 | 14.0 | 5.5 | 11.5 | 15.5 | 16.0 | 7.0 |
| 31 | 3.0 | --- | 0.5 | 0.0 | --- | 5.0 | --- | 5.0 | --- | --- | 16.5 | --- |
| MONTH | 6.5 | 3.5 | 0.5 | 1.0 | 2.0 | 3.5 | 8.5 | 10.0 | 7.5 | 13.0 | 16.0 | --- |
| YEAR | 7.0 | | | | | | | | | | | |

06202610 STILLWATER RIVER AT BEEHIVE, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 268 | 2 | 1.4 | 177 | 7 | 3.3 | 144 | 1 | .39 |
| 2 | 264 | 3 | 2.1 | 158 | 2 | .85 | 144 | 1 | .39 |
| 3 | 250 | 2 | 1.4 | 154 | 17 | 7.1 | 140 | 1 | .38 |
| 4 | 240 | 2 | 1.3 | 154 | 19 | 7.9 | 144 | 2 | .78 |
| 5 | 246 | 2 | 1.3 | 173 | 10 | 4.7 | 140 | 2 | .76 |
| 6 | 259 | 2 | 1.4 | 169 | 14 | 6.4 | 151 | 3 | 1.2 |
| 7 | 255 | 2 | 1.4 | 165 | 1 | .45 | 148 | 2 | .80 |
| 8 | 250 | 1 | .68 | 162 | 5 | 2.2 | 140 | 1 | .38 |
| 9 | 246 | 3 | 2.0 | 158 | 3 | 1.3 | 137 | 1 | .37 |
| 10 | 246 | 8 | 5.3 | 162 | 5 | 2.2 | 127 | 1 | .34 |
| 11 | 236 | 2 | 1.3 | 144 | 23 | 8.9 | 124 | 1 | .33 |
| 12 | 246 | 4 | 2.7 | 169 | 23 | 10 | 109 | 1 | .29 |
| 13 | 250 | 1 | .68 | 158 | 2 | .85 | 119 | 2 | .64 |
| 14 | 232 | 2 | 1.3 | 140 | 3 | 1.1 | 134 | 3 | 1.1 |
| 15 | 218 | 2 | 1.2 | 144 | 6 | 2.3 | 127 | 4 | 1.4 |
| 16 | 228 | 2 | 1.2 | 151 | 2 | .82 | 137 | 7 | 2.6 |
| 17 | 218 | 2 | 1.2 | 158 | 3 | 1.3 | 130 | 2 | .70 |
| 18 | 223 | 2 | 1.2 | 151 | 2 | .82 | 134 | 3 | 1.1 |
| 19 | 218 | 2 | 1.2 | 137 | 2 | .74 | 140 | 2 | .76 |
| 20 | 214 | 2 | 1.2 | 151 | 11 | 4.5 | 110 | 4 | 1.2 |
| 21 | 210 | 2 | 1.1 | 144 | 2 | .78 | 130 | 3 | 1.1 |
| 22 | 205 | 2 | 1.1 | 121 | 2 | .65 | 110 | 2 | .59 |
| 23 | 201 | 2 | 1.1 | 133 | 3 | 1.1 | 100 | 2 | .54 |
| 24 | 201 | 2 | 1.1 | 189 | 4 | 2.0 | 125 | 2 | .68 |
| 25 | 189 | 2 | 1.0 | 193 | 2 | 1.0 | 150 | 3 | 1.2 |
| 26 | 181 | 2 | .98 | 162 | 2 | .87 | 160 | 2 | .86 |
| 27 | 164 | 1 | .44 | 154 | 2 | .83 | 160 | 2 | .86 |
| 28 | 169 | 2 | .91 | 162 | 2 | .87 | 150 | 2 | .81 |
| 29 | 205 | 4 | 2.2 | 158 | 9 | 3.8 | 140 | 3 | 1.1 |
| 30 | 193 | 1 | .52 | 158 | 7 | 3.0 | 135 | 2 | .73 |
| 31 | 189 | 2 | 1.0 | -- | -- | -- | 130 | 2 | .70 |
| TOTAL | 6914 | -- | 42.91 | 4709 | -- | 82.63 | 4169 | -- | 25.08 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 120 | 2 | .65 | 137 | 2 | .74 | 90 | 2 | .49 |
| 2 | 110 | 2 | .59 | 124 | 2 | .67 | 86 | 2 | .46 |
| 3 | 100 | 2 | .54 | 121 | 2 | .65 | 127 | 6 | 2.1 |
| 4 | 90 | 2 | .49 | 109 | 2 | .59 | 95 | 4 | 1.0 |
| 5 | 95 | 2 | .51 | 105 | 2 | .57 | 97 | 2 | .52 |
| 6 | 100 | 5 | 1.4 | 100 | 2 | .54 | 90 | 3 | .73 |
| 7 | 110 | 2 | .59 | 124 | 2 | .67 | 97 | 9 | 2.4 |
| 8 | 120 | 3 | .97 | 137 | 2 | .74 | 90 | 2 | .49 |
| 9 | 130 | 3 | 1.1 | 124 | 2 | .67 | 84 | 2 | .45 |
| 10 | 115 | 2 | .62 | 118 | 2 | .64 | 87 | 3 | .70 |
| 11 | 105 | 6 | 1.7 | 112 | 2 | .60 | 87 | 5 | 1.2 |
| 12 | 95 | 2 | .51 | 109 | 2 | .59 | 84 | 13 | 2.9 |
| 13 | 100 | 2 | .54 | 118 | 2 | .64 | 90 | 3 | .73 |
| 14 | 110 | 2 | .59 | 112 | 1 | .30 | 79 | 2 | .43 |
| 15 | 120 | 2 | .65 | 109 | 2 | .59 | 80 | 3 | .65 |
| 16 | 130 | 5 | 1.8 | 95 | 2 | .51 | 77 | 2 | .42 |
| 17 | 140 | 4 | 1.5 | 85 | 2 | .46 | 72 | 4 | .78 |
| 18 | 151 | 4 | 1.6 | 97 | 2 | .52 | 74 | 2 | .40 |
| 19 | 140 | 4 | 1.5 | 95 | 2 | .51 | 84 | 3 | .68 |
| 20 | 144 | 5 | 1.9 | 87 | 2 | .47 | 79 | 2 | .43 |
| 21 | 127 | 2 | .69 | 78 | 1 | .21 | 72 | 3 | .58 |
| 22 | 110 | 1 | .30 | 103 | 2 | .56 | 72 | 2 | .39 |
| 23 | 115 | 10 | 3.1 | 97 | 1 | .26 | 74 | 4 | .80 |
| 24 | 120 | 4 | 1.3 | 100 | 2 | .54 | 74 | 2 | .40 |
| 25 | 120 | 3 | .97 | 90 | 1 | .24 | 74 | 1 | .20 |
| 26 | 120 | 3 | .97 | 95 | 2 | .51 | 79 | 2 | .43 |
| 27 | 124 | 1 | .33 | 80 | 1 | .22 | 79 | 3 | .64 |
| 28 | 120 | 2 | .65 | 100 | 1 | .27 | 72 | 4 | .78 |
| 29 | 115 | 1 | .31 | -- | -- | -- | 72 | 4 | .78 |
| 30 | 125 | 2 | .68 | -- | -- | -- | 74 | 3 | .60 |
| 31 | 134 | 2 | .72 | -- | -- | -- | 82 | 4 | .89 |
| TOTAL | 3655 | -- | 29.77 | 2961 | -- | 14.48 | 2573 | -- | 24.45 |

06202610 STILLWATER RIVER AT BEEHIVE, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 72 | 2 | .39 | 201 | 4 | 2.2 | 1310 | 16 | 57 |
| 2 | 65 | 2 | .35 | 250 | 5 | 3.4 | 1220 | 13 | 43 |
| 3 | 72 | 2 | .39 | 310 | 7 | 5.9 | 1310 | 12 | 42 |
| 4 | 65 | 2 | .35 | 351 | 5 | 4.7 | 1440 | 15 | 58 |
| 5 | 70 | 1 | .19 | 395 | 4 | 4.3 | 1480 | 12 | 48 |
| 6 | 74 | 1 | .20 | 436 | 5 | 5.9 | 1600 | 16 | 69 |
| 7 | 79 | 3 | .64 | 484 | 6 | 7.8 | 1660 | 23 | 103 |
| 8 | 84 | 3 | .68 | 534 | 7 | 10 | 2240 | 35 | 212 |
| 9 | 82 | 2 | .44 | 534 | 7 | 10 | 2900 | 115 | 900 |
| 10 | 90 | 2 | .49 | 508 | 4 | 5.5 | 3220 | 146 | 1270 |
| 11 | 82 | 2 | .44 | 569 | 3 | 4.6 | 3500 | 97 | 917 |
| 12 | 84 | 1 | .23 | 668 | 9 | 16 | 3200 | 50 | 432 |
| 13 | 67 | 2 | .36 | 856 | 11 | 25 | 3430 | 60 | 556 |
| 14 | 84 | 1 | .23 | 937 | 13 | 33 | 3500 | 55 | 520 |
| 15 | 97 | 4 | 1.0 | 883 | 6 | 14 | 3690 | 60 | 598 |
| 16 | 112 | 2 | .60 | 973 | 9 | 24 | 3450 | 37 | 345 |
| 17 | 103 | 3 | .83 | 928 | 7 | 18 | 3760 | 54 | 548 |
| 18 | 103 | 1 | .28 | 780 | 4 | 8.4 | 3470 | 27 | 253 |
| 19 | 95 | 2 | .51 | 653 | 4 | 7.1 | 3780 | 38 | 388 |
| 20 | 95 | 2 | .51 | 590 | 3 | 4.8 | 3570 | 44 | 424 |
| 21 | 95 | 7 | 1.8 | 527 | 1 | 1.4 | 4220 | 59 | 672 |
| 22 | 134 | 11 | 4.0 | 508 | 3 | 4.1 | 4620 | 95 | 1190 |
| 23 | 124 | 5 | 1.7 | 466 | 1 | 1.3 | 5200 | 97 | 1360 |
| 24 | 162 | 7 | 3.1 | 484 | 8 | 10 | 4940 | 54 | 720 |
| 25 | 340 | 30 | 28 | 555 | 4 | 6.0 | 4460 | 30 | 361 |
| 26 | 223 | 10 | 6.0 | 804 | 5 | 11 | 3840 | 25 | 259 |
| 27 | 197 | 5 | 2.7 | 1310 | 20 | 71 | 3880 | 36 | 377 |
| 28 | 189 | 4 | 2.0 | 1880 | 43 | 218 | 3160 | 20 | 171 |
| 29 | 189 | 4 | 2.0 | 2270 | 83 | 509 | 2330 | 14 | 88 |
| 30 | 189 | 4 | 2.0 | 1770 | 67 | 320 | 1880 | 12 | 61 |
| 31 | -- | -- | -- | 1410 | 24 | 91 | -- | -- | -- |
| TOTAL | 3517 | -- | 62.41 | 23824 | -- | 1457.4 | 92260 | -- | 13042 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1920 | 10 | 52 | 772 | 1 | 2.1 | 448 | 1 | 1.2 |
| 2 | 2240 | 16 | 97 | 772 | 1 | 2.1 | 395 | 2 | 2.1 |
| 3 | 3220 | 44 | 383 | 812 | 2 | 4.4 | 460 | 11 | 14 |
| 4 | 2780 | 11 | 83 | 919 | 2 | 5.0 | 490 | 4 | 5.3 |
| 5 | 2430 | 16 | 105 | 847 | 1 | 2.3 | 460 | 2 | 2.5 |
| 6 | 2400 | 19 | 123 | 829 | 1 | 2.2 | 478 | 2 | 2.6 |
| 7 | 2420 | 18 | 118 | 796 | 1 | 2.1 | 508 | 2 | 2.7 |
| 8 | 2100 | 13 | 74 | 788 | 1 | 2.1 | 541 | 2 | 2.9 |
| 9 | 1990 | 16 | 86 | 740 | 1 | 2.0 | 478 | 1 | 1.3 |
| 10 | 2150 | 15 | 87 | 676 | 1 | 1.8 | 448 | 1 | 1.2 |
| 11 | 2200 | 20 | 119 | 639 | 4 | 6.9 | 412 | 2 | 2.2 |
| 12 | 2020 | 16 | 87 | 590 | 10 | 16 | 395 | 2 | 2.1 |
| 13 | 1900 | 12 | 62 | 632 | 1 | 1.7 | 373 | 1 | 1.0 |
| 14 | 1840 | 12 | 60 | 527 | 1 | 1.4 | 367 | 2 | 2.0 |
| 15 | 1800 | 13 | 63 | 520 | 1 | 1.4 | 351 | 1 | .95 |
| 16 | 1740 | 9 | 42 | 514 | 1 | 1.4 | 345 | 1 | .93 |
| 17 | 1730 | 10 | 47 | 508 | 1 | 1.4 | 340 | 1 | .92 |
| 18 | 1870 | 13 | 66 | 484 | 1 | 1.3 | 320 | 1 | .86 |
| 19 | 1660 | 9 | 40 | 460 | 1 | 1.2 | 320 | 1 | .86 |
| 20 | 1520 | 8 | 33 | 442 | 1 | 1.2 | 330 | 2 | 1.8 |
| 21 | 1430 | 7 | 27 | 418 | 2 | 2.3 | 310 | 1 | .84 |
| 22 | 1400 | 6 | 23 | 400 | 1 | 1.1 | 295 | 1 | .80 |
| 23 | 1290 | 5 | 17 | 400 | 1 | 1.1 | 291 | 1 | .79 |
| 24 | 1220 | 4 | 13 | 389 | 1 | 1.1 | 277 | 1 | .75 |
| 25 | 1220 | 4 | 13 | 362 | 1 | .98 | 273 | 1 | .74 |
| 26 | 1120 | 13 | 39 | 345 | 1 | .93 | 273 | 1 | .74 |
| 27 | 1010 | 17 | 46 | 335 | 1 | .90 | 264 | 1 | .71 |
| 28 | 955 | 6 | 15 | 335 | 1 | .90 | 259 | 1 | .70 |
| 29 | 874 | 3 | 7.1 | 373 | 1 | 1.0 | 250 | 1 | .68 |
| 30 | 874 | 3 | 7.1 | 520 | 1 | 1.4 | 264 | 1 | .71 |
| 31 | 812 | 2 | 4.4 | 514 | 3 | 4.2 | -- | -- | -- |
| TOTAL | 54135 | -- | 2038.6 | 17658 | -- | 75.91 | 11015 | -- | 56.88 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 227390
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 16952.52

## 06207500 CLARKS FORK YELLOWSTONE RIVER NEAR BELFRY, MONT.

LOCATION.--Lat 45°00'40", long 109°04'00", in E½NE¼ sec.31, T.9 S., R.22 E., Carbon County, at bridge on county road 0.4 mile downstream from gaging station, just upstream from Sand Coulee, 0.8 mile north of Wyoming-Montana State line, 9.5 miles southwest of Belfry, and at mile 78.1.

DRAINAGE AREA.--1,154 sq mi (at gaging station).

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED SILICA (SIO2) (MG/L) | TOTAL IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) | DIS-SOLVED CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 12... | 1525 | 346 | 10 | 60 | 36 | 10 | 10 | 1.3 | 141 | 0 | 34 | .9 |
| NOV. | | | | | | | | | | | | |
| 16... | 1645 | 311 | 8.3 | 90 | 48 | 7.1 | 10 | 1.6 | 137 | 6 | 47 | .1 |
| DEC. | | | | | | | | | | | | |
| 10... | 1120 | 346 | 8.7 | 60 | 42 | 9.1 | 9.2 | 1.1 | 140 | 0 | 42 | 5.0 |
| JAN. | | | | | | | | | | | | |
| 19... | 1515 | 306 | 11 | 10 | 40 | 12 | 10 | .9 | 137 | 0 | 49 | 2.2 |
| MAR. | | | | | | | | | | | | |
| 15... | 1450 | 222 | 12 | 90 | 31 | 20 | 10 | 1.3 | 153 | 0 | 52 | 3.2 |
| MAY | | | | | | | | | | | | |
| 13... | 1625 | 2900 | 10 | 210 | 23 | 3.1 | 5.3 | .9 | 81 | 0 | 16 | 1.1 |
| JUNE | | | | | | | | | | | | |
| 08... | 1255 | 4710 | 9.2 | 30 | 15 | 1.6 | 2.2 | .4 | 55 | 0 | 4.9 | .3 |
| JULY | | | | | | | | | | | | |
| 15... | 1700 | 3790 | 6.7 | 60 | 11 | 2.6 | 3.3 | .4 | 48 | 0 | 5.8 | .6 |
| AUG. | | | | | | | | | | | | |
| 03... | 1630 | 1630 | 5.4 | 150 | 17 | 2.4 | 5.9 | .9 | 62 | 0 | 12 | .0 |
| SEP. | | | | | | | | | | | | |
| 08... | 1630 | 823 | 9.0 | 140 | 29 | 4.4 | 6.0 | 1.3 | 85 | 6 | 20 | 1.0 |

06207500 CLARKS FORK YELLOWSTONE RIVER NEAR BELFRY, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: October 1965 to September 1971.
Water temperatures: October 1965 to September 1969.
Sediment records: April to August 1971 (discontinued).

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS_ SOLVED NITRATE (NO3) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) | TEMP-ERATURE (DEG C) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 12... | .1 | .5 | 0 | 170 | .20 | 140 | 130 | 14 | .4 | 298 | 8.2 | 10.0 |
| NOV. | | | | | | | | | | | | |
| 16... | .2 | .6 | 120 | 196 | .28 | 175 | 150 | 28 | .4 | 336 | 8.4 | 6.5 |
| DEC. | | | | | | | | | | | | |
| 10... | .2 | .4 | 0 | 187 | .26 | 181 | 140 | 25 | .3 | 299 | 8.3 | 1.5 |
| JAN. | | | | | | | | | | | | |
| 19... | .2 | 1.1 | 10 | 193 | .26 | 160 | 150 | 38 | .4 | 329 | 7.5 | -- |
| MAR. | | | | | | | | | | | | |
| 15... | .2 | .4 | 30 | 205 | .27 | 121 | 160 | 34 | .3 | 327 | 8.3 | 6.0 |
| MAY | | | | | | | | | | | | |
| 13... | .5 | .5 | 20 | 101 | .14 | 830 | 70 | 4 | .3 | 152 | 7.9 | -- |
| JUNE | | | | | | | | | | | | |
| 08... | .1 | .3 | 10 | 61 | .09 | 814 | 45 | 0 | .1 | 106 | 7.7 | 10.0 |
| JULY | | | | | | | | | | | | |
| 15... | .1 | .2 | 100 | 55 | .08 | 594 | 39 | 0 | .2 | 85 | 7.9 | 15.5 |
| AUG. | | | | | | | | | | | | |
| 03... | .1 | .2 | 20 | 74 | .10 | 334 | 51 | 0 | .4 | 132 | 8.1 | 19.5 |
| SEP. | | | | | | | | | | | | |
| 08... | .2 | .6 | 10 | 120 | .17 | 276 | 90 | 10 | .3 | 198 | 8.4 | 16.0 |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, APRIL TO AUGUST 1971

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| APR. | | | | | | | | | | | |
| 29... | 1100 | 9.0 | 477 | 582 | 750 | 68 | 91 | 100 | -- | -- | -- |
| MAY | | | | | | | | | | | |
| 28... | 1045 | 9.0 | 4660 | 1910 | 24000 | 14 | 28 | 56 | 72 | 91 | 100 |
| JUNE | | | | | | | | | | | |
| 24... | 1500 | 10.0 | 9400 | 516 | 13100 | -- | -- | -- | -- | -- | -- |
| AUG. | | | | | | | | | | | |
| 18... | 1150 | 16.5 | 862 | 13 | 30 | -- | -- | -- | -- | -- | -- |

## 06207540 SILVER TIP CREEK NEAR BELFRY, MONT.

LOCATION.--Lat 45°09'30", long 108°58'30", in N½ sec.12, T.8 S., R.22 E., Carbon County, at gaging station 2 miles upstream from mouth and 2 miles northeast of Belfry.

DRAINAGE AREA.--87.6 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.
Water temperatures: October 1969 to September 1971.
Sediment records: October 1968 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 5,510 mg/l June 16-30, Aug. 23-31; minimum, 1,310 mg/l Feb. 13-17.
Hardness: Maximum, 1,400 mg/l July 1-6, Aug. 23-31; minimum, 380 mg/l Feb. 13-17.
Specific conductance: Maximum daily, 7,850 micromhos July 30; minimum daily, 225 micromhos Feb. 13.
Water temperatures: Maximum observed, 28.0°C June 23, July 23; minimum, freezing point on several days during November, December and February.
Sediment concentrations: Maximum daily, 36,800 mg/l Mar. 20; minimum daily, no flow for many days during year.
Sediment discharge: Maximum daily, 559 tons Mar. 12; minimum daily, 0 tons on many days during year.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | .72 | -- | 15 | -- | 260 | 120 | 1060 | 73 | 326 | 0 | 2700 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | .62 | -- | 13 | -- | 270 | 120 | 1040 | 64 | 325 | 0 | 2700 |
| DEC. | | | | | | | | | | | | |
| 01-11 | -- | .39 | -- | 12 | 100 | 240 | 120 | 1100 | 54 | 224 | 0 | 2600 |
| FEB. | | | | | | | | | | | | |
| 13-17 | -- | 11 | -- | 6.1 | 40 | 97 | 34 | 270 | 17 | 178 | -- | 700 |
| 18-22 | -- | .56 | -- | 7.6 | 40 | 230 | 100 | 820 | 34 | 295 | -- | 2100 |
| MAR. | | | | | | | | | | | | |
| 09-17 | -- | 5.1 | -- | 11 | 30 | 140 | 53 | 520 | 26 | 258 | -- | 1200 |
| 19-21 | -- | .20 | -- | 14 | 80 | 240 | 100 | 940 | 35 | 215 | -- | 2300 |
| 24-31 | -- | 2.1 | -- | 14 | 60 | 230 | 94 | 830 | 40 | 314 | -- | 2200 |
| APR. | | | | | | | | | | | | |
| 01-23 | -- | .91 | -- | 12 | 30 | 250 | 110 | 980 | 18 | 312 | 0 | 2300 |
| 24-30 | -- | 1.1 | -- | 12 | 20 | 250 | 120 | 1000 | 17 | 354 | 0 | 2400 |
| MAY | | | | | | | | | | | | |
| 09-12 | -- | .08 | -- | 13 | 10 | 260 | 160 | 1200 | 36 | 297 | 0 | 3100 |
| 18-25 | -- | 1.6 | -- | 13 | 20 | 250 | 110 | 940 | 36 | 261 | 0 | 2300 |
| JUNE | | | | | | | | | | | | |
| 01-10 | -- | .94 | -- | 12 | 20 | 250 | 110 | 1100 | 42 | 291 | 0 | 2700 |
| 16-30 | -- | .18 | -- | 17 | 20 | 290 | 150 | 1200 | 55 | 289 | 0 | 3100 |
| JULY | | | | | | | | | | | | |
| 01-06 | -- | .63 | -- | 15 | 10 | 340 | 140 | 1200 | 71 | 333 | 0 | 3000 |
| AUG. | | | | | | | | | | | | |
| 23-31 | -- | .56 | -- | 16 | 10 | 300 | 150 | 1200 | 57 | 288 | 0 | 3200 |
| SEP. | | | | | | | | | | | | |
| 01-05 | -- | 2.6 | -- | 14 | 10 | 270 | 110 | 950 | 59 | 301 | 0 | 2500 |
| 06-11 | -- | .61 | -- | 14 | 10 | 290 | 130 | 1100 | 69 | 297 | 0 | 2900 |
| 15-30 | -- | 1.3 | -- | 15 | 0 | 280 | 130 | 1100 | 71 | 309 | 0 | 2700 |
| WTD. AVG. | -- | -- | -- | 12 | -- | 207 | 89 | 778 | 40 | 272 | 0 | 1940 |
| TIME WTD. AVG. | -- | 1.3 | -- | 13 | -- | 256 | 117 | 1010 | 51 | 299 | 0 | 2540 |
| TONS PER DAY | -- | -- | -- | .0 | -- | .7 | .3 | 2.7 | .1 | 1 | 0 | 6.6 |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| FEB. | | | | | | | | | | | | |
| 15... | 1430 | 16 | | .0 | 5.3 | 280 | 110 | 34 | 370 | 21 | 180 | 0 | 800 |
| MAR. | | | | | | | | | | | | |
| 12... | 1430 | 8.1 | | .5 | 6.3 | 140 | 130 | 54 | 510 | 22 | 225 | 0 | 1100 |
| JUNE | | | | | | | | | | | | |
| 02... | 1415 | 6.9 | | 18.5 | 12 | 200 | 170 | 62 | 600 | 14 | 283 | 0 | 1400 |
| SEP. | | | | | | | | | | | | |
| 04... | 1215 | 8.5 | | 13.0 | 7.1 | 20 | 160 | 58 | 650 | 44 | 323 | 0 | 1600 |

06207540 SILVER TIP CREEK NEAR BELFRY, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 6,240 mg/l Dec. 22-27, 1968; minimum, 1,310 mg/l Feb. 13-17, 1971.
Hardness: Maximum, 1,510 mg/l Dec. 22-27, 1968; minimum, 380 mg/l Feb. 13-17, 1971.
Specific conductance: Maximum daily, 8,100 micromhos Dec. 22, 23, 1968; minimum daily, 225 micromhos Feb. 13, 1971.
Water temperatures (1969-71): Maximum observed, 28.0°C June 23, 1970, June 23, July 23, 1971; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 60,300 mg/l July 12, 1970; minimum daily, no flow for many days each year.
Sediment discharge: Maximum daily, 40,200 tons June 26, 1969; minimum daily, 0 tons on many days each year.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. No flow for many days during water year. Flow affected by ice most of winter months.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 410 | 1.5 | -- | -- | 4790 | 6.77 | 9.68 | 1200 | 900 | 14 | 5950 | 7.7 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 390 | 1.1 | -- | -- | 4760 | 6.77 | 8.34 | 1200 | 910 | 13 | 5700 | 8.0 |
| DEC. | | | | | | | | | | | | |
| 01-11 | 380 | .9 | .00 | .20 | 4600 | 6.26 | 4.84 | 1100 | 920 | 15 | 6010 | 8.2 |
| FEB. | | | | | | | | | | | | |
| 13-17 | 96 | .8 | .60 | .25 | 1310 | 1.78 | 38.9 | 380 | 240 | 6.0 | 1810 | 8.0 |
| 18-22 | 270 | 1.1 | .20 | .06 | 3710 | 5.05 | 5.61 | 990 | 740 | 11 | 4410 | 8.1 |
| MAR. | | | | | | | | | | | | |
| 09-17 | 180 | .6 | .10 | .00 | 2260 | 3.07 | 31.1 | 570 | 360 | 9.5 | 3230 | 8.3 |
| 19-21 | 370 | .8 | .10 | .09 | 4110 | 5.59 | 2.22 | 1000 | 830 | 13 | 5410 | 8.0 |
| 24-31 | 310 | .8 | .00 | .09 | 3870 | 5.26 | 22.8 | 960 | 700 | 12 | 4990 | 8.0 |
| APR. | | | | | | | | | | | | |
| 01-23 | 290 | .7 | .01 | .03 | 4110 | 5.59 | 10.1 | 1100 | 820 | 13 | 5340 | 7.8 |
| 24-30 | 360 | .9 | .01 | .03 | 4330 | 5.89 | 12.9 | 1100 | 830 | 13 | 5680 | 8.2 |
| MAY | | | | | | | | | | | | |
| 09-12 | 490 | 1.3 | .01 | .06 | 5410 | 7.36 | 1.17 | 1300 | 1100 | 14 | 6940 | 7.9 |
| 18-25 | 330 | 1.0 | .02 | .06 | 4110 | 5.59 | 17.8 | 1100 | 860 | 12 | 5470 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 01-10 | 380 | 1.3 | .28 | .09 | 4740 | 6.45 | 12.0 | 1100 | 840 | 15 | 5900 | 8.0 |
| 16-30 | 550 | 1.4 | .67 | .18 | 5510 | 7.49 | 2.68 | 1300 | 1100 | 14 | 7020 | 8.0 |
| JULY | | | | | | | | | | | | |
| 01-06 | 520 | 1.7 | .02 | .09 | 5450 | 7.41 | 9.27 | 1400 | 1200 | 14 | 6990 | 7.2 |
| AUG. | | | | | | | | | | | | |
| 23-31 | 440 | 1.4 | .25 | .12 | 5510 | 7.49 | 8.33 | 1400 | 1100 | 14 | 7200 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-05 | 410 | 1.6 | .35 | .12 | 4460 | 6.07 | 31.3 | 1100 | 880 | 12 | 5930 | 8.0 |
| 06-11 | 460 | 1.8 | .54 | .12 | 5110 | 6.95 | 8.42 | 1300 | 1000 | 13 | 6400 | 8.1 |
| 15-30 | 450 | 1.7 | .32 | .09 | 4900 | 6.66 | 17.2 | 1200 | 980 | 14 | 6270 | 8.0 |
| WTD. AVG. | 287 | 1.0 | -- | -- | 3490 | 4.78 | -- | 888 | 662 | 11 | 4530 | 8.0 |
| TIME WTD. AVG. | 382 | 1.2 | -- | -- | 4520 | 6.23 | -- | 1130 | 880 | 13 | 5740 | 7.9 |
| TONS PER DAY | .0 | .0 | -- | -- | 12 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| FEB. | | | | | | | | | | | | |
| 15... | 140 | .6 | .00 | .10 | 1600 | 2.18 | 69.1 | 420 | 270 | 7.9 | 2180 | 7.4 |
| MAR. | | | | | | | | | | | | |
| 12... | 160 | .8 | .10 | .20 | 2100 | 2.86 | 45.9 | 540 | 360 | 9.5 | 3090 | 7.4 |
| JUNE | | | | | | | | | | | | |
| 02... | 200 | .9 | .52 | .15 | 2600 | 3.54 | 48.4 | 680 | 450 | 10 | 3720 | 7.1 |
| SEP. | | | | | | | | | | | | |
| 04... | 230 | 1.3 | .60 | .12 | 2890 | 3.93 | 66.3 | 640 | 370 | 11 | 3780 | 7.0 |

06207540 SILVER TIP CREEK NEAR BELFRY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| FEB. 15... | 1430 | 16 | .030 | 880 | 0 |
| MAR. 12... | 1430 | 8.1 | .030 | -- | 150 |
| JUNE 02... | 1415 | 6.9 | .060 | 1200 | 310 |
| SEP. 04... | 1215 | 8.5 | .11 | 1600 | 140 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6300 | 5920 | 5440 | --- | --- | --- | 4610 | --- | 5840 | 6830 | --- | 6670 |
| 2 | 6340 | 6730 | 6220 | --- | --- | --- | 5520 | --- | 5110 | 6680 | --- | 6900 |
| 3 | 6450 | --- | 6160 | --- | --- | --- | 5480 | --- | 5640 | 6600 | --- | 5110 |
| 4 | 6200 | 6350 | 7480 | --- | --- | --- | 5590 | --- | 6280 | 7010 | --- | 4720 |
| 5 | 6440 | 5170 | 5990 | --- | --- | --- | 5690 | 5990 | --- | 6870 | --- | 5200 |
| 6 | 6330 | 6000 | 6930 | --- | --- | --- | 6020 | --- | --- | 7170 | --- | 6130 |
| 7 | 6310 | 6060 | 5540 | --- | --- | --- | 6140 | --- | 6760 | --- | --- | 6040 |
| 8 | 6350 | 6060 | 5450 | --- | --- | --- | 6300 | --- | 6790 | --- | --- | 6140 |
| 9 | 6300 | 6090 | 5990 | --- | --- | 638 | 6440 | 6680 | 6360 | 7310 | --- | 6250 |
| 10 | 6180 | 5710 | 5550 | --- | --- | 656 | 6710 | --- | 3630 | --- | --- | 6530 |
| 11 | 6240 | 6070 | 5670 | --- | --- | 2340 | 6300 | --- | --- | --- | --- | 6650 |
| 12 | 5810 | 6040 | --- | --- | --- | 3170 | 6610 | 6730 | --- | --- | --- | --- |
| 13 | 5820 | 6160 | --- | --- | 225 | 2850 | 6320 | --- | 1540 | --- | --- | 6530 |
| 14 | 5840 | 6190 | --- | --- | 1710 | 3620 | 6560 | --- | --- | --- | --- | --- |
| 15 | 6170 | 6050 | --- | --- | 2460 | 4090 | 6280 | --- | --- | --- | --- | 6660 |
| 16 | 6060 | 6120 | --- | --- | 2380 | 4940 | 6300 | --- | 7260 | --- | --- | 6280 |
| 17 | 6090 | 6070 | --- | --- | 2820 | 4970 | 6420 | --- | 7470 | --- | --- | 5740 |
| 18 | 6180 | 6060 | --- | --- | 4130 | --- | 5690 | 6380 | 6640 | --- | --- | 6140 |
| 19 | 6200 | 6060 | --- | --- | 4430 | 5330 | 6370 | 6710 | 6940 | --- | --- | 6200 |
| 20 | 6220 | 5930 | --- | --- | 4960 | 4890 | 5740 | 6960 | --- | --- | --- | 5900 |
| 21 | 6220 | 5830 | --- | --- | 5280 | 5490 | 6040 | 6730 | --- | --- | --- | 6080 |
| 22 | 6180 | --- | --- | --- | 6860 | --- | 4250 | 4770 | --- | --- | --- | 6080 |
| 23 | 6200 | --- | --- | --- | --- | --- | 4260 | 4200 | 7120 | 6820 | 7140 | 6150 |
| 24 | 6180 | 1240 | --- | --- | --- | 4460 | 6420 | 5890 | --- | --- | --- | 6250 |
| 25 | 6200 | 5610 | --- | --- | --- | 4480 | 5420 | 6340 | --- | --- | 7330 | 6290 |
| 26 | 6170 | --- | --- | --- | --- | 4670 | 5570 | --- | --- | --- | --- | 6370 |
| 27 | 6080 | --- | --- | --- | --- | 4590 | 5070 | --- | 6870 | --- | 7120 | 6140 |
| 28 | 5960 | --- | --- | --- | --- | 5070 | 5800 | --- | --- | --- | 7330 | 6150 |
| 29 | 5950 | --- | --- | --- | --- | 5420 | 6280 | --- | 6450 | 7590 | 6520 | 6240 |
| 30 | 6000 | 5190 | --- | --- | --- | 5420 | 6300 | 6120 | 6700 | 7850 | --- | 6240 |
| 31 | 6200 | --- | --- | --- | --- | 4430 | --- | 4790 | --- | --- | 7120 | --- |
| MONTH | 6170 | --- | --- | --- | --- | --- | 5880 | --- | --- | --- | --- | 6140 |
| YEAR | 5780 | | | | | | | | | | | |

06207540 SILVER TIP CREEK NEAR BELFRY, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.5 | 6.0 | 1.0 | --- | --- | --- | 6.0 | --- | 18.0 | 25.0 | --- | 18.0 |
| 2 | 18.0 | 2.0 | 0.0 | --- | --- | --- | 0.0 | --- | 12.0 | 23.0 | --- | 19.0 |
| 3 | 16.0 | 2.0 | 1.0 | --- | --- | --- | 10.0 | --- | 20.0 | 23.0 | --- | 12.0 |
| 4 | 16.5 | 3.0 | 2.0 | --- | --- | --- | 12.0 | --- | 24.0 | 24.0 | --- | 10.0 |
| 5 | 16.5 | 4.0 | 0.0 | --- | --- | --- | 12.5 | 11.0 | --- | 25.0 | --- | 10.0 |
| 6 | 13.0 | 0.0 | 0.0 | --- | --- | --- | 15.0 | --- | 25.0 | 21.0 | --- | 22.0 |
| 7 | 9.0 | 5.5 | 0.0 | --- | --- | --- | 16.5 | --- | 24.0 | --- | --- | 18.0 |
| 8 | 4.0 | 7.5 | 4.0 | --- | --- | --- | 17.0 | --- | 26.0 | --- | --- | 21.0 |
| 9 | 9.5 | 6.5 | 1.0 | --- | --- | 5.0 | 14.0 | 14.0 | 20.0 | 27.0 | --- | 22.0 |
| 10 | 11.0 | 6.0 | 0.0 | --- | --- | 7.0 | 7.0 | 19.0 | --- | --- | --- | 23.0 |
| 11 | 11.0 | 2.0 | 0.0 | --- | --- | 2.5 | 8.0 | --- | --- | --- | --- | 22.0 |
| 12 | 7.5 | 6.0 | --- | --- | --- | 3.0 | 7.0 | 23.0 | --- | --- | --- | --- |
| 13 | 6.5 | 3.0 | --- | --- | 10.0 | 3.0 | 12.5 | --- | 20.0 | --- | --- | 19.0 |
| 14 | 7.0 | 4.0 | --- | --- | 5.0 | 3.5 | 17.0 | --- | --- | --- | --- | --- |
| 15 | 9.0 | 3.0 | --- | --- | 0.0 | 1.0 | 10.0 | --- | --- | --- | --- | 10.0 |
| 16 | 9.5 | 7.0 | --- | --- | 3.0 | 1.0 | 8.0 | --- | 24.0 | --- | --- | 9.0 |
| 17 | 11.5 | 5.0 | --- | --- | 2.0 | 1.0 | 13.0 | --- | 24.0 | --- | --- | 15.0 |
| 18 | 9.0 | 5.5 | --- | --- | 3.0 | --- | 7.0 | 16.0 | 25.0 | --- | --- | 15.0 |
| 19 | 11.0 | 3.5 | --- | --- | 1.0 | 3.0 | 8.0 | 8.0 | 23.0 | --- | --- | 14.0 |
| 20 | 12.5 | 3.0 | --- | --- | 1.0 | 7.0 | 7.0 | 17.0 | --- | --- | --- | --- |
| 21 | 10.0 | 0.0 | --- | --- | 1.0 | 1.0 | 7.0 | 7.0 | --- | --- | --- | 12.0 |
| 22 | 11.5 | --- | --- | --- | 1.0 | --- | 7.0 | 6.0 | --- | --- | --- | 14.5 |
| 23 | 10.0 | --- | --- | --- | --- | --- | 8.5 | 8.0 | 28.0 | 28.0 | --- | 18.0 |
| 24 | 9.0 | --- | --- | --- | --- | 7.0 | 14.0 | 12.0 | --- | --- | --- | 20.0 |
| 25 | 5.0 | 0.0 | --- | --- | --- | 7.5 | 7.0 | 8.0 | --- | --- | 23.0 | 13.0 |
| 26 | 2.5 | --- | --- | --- | --- | 9.0 | 4.0 | --- | --- | --- | --- | 10.0 |
| 27 | 2.5 | --- | --- | --- | --- | 10.0 | 13.0 | --- | 21.0 | --- | 26.0 | 15.0 |
| 28 | 1.5 | --- | --- | --- | --- | 11.0 | 7.5 | --- | 19.0 | --- | 27.0 | 15.0 |
| 29 | 3.0 | --- | --- | --- | --- | 13.0 | 15.0 | --- | 24.0 | 23.0 | 16.0 | 13.0 |
| 30 | 5.5 | 3.0 | --- | --- | --- | 12.0 | 10.0 | 9.0 | 25.5 | 25.0 | --- | 12.0 |
| 31 | 5.0 | --- | --- | --- | --- | 4.0 | --- | 9.0 | --- | --- | 25.0 | --- |
| MONTH | 9.5 | --- | --- | --- | --- | --- | 10.0 | --- | --- | --- | --- | 15.5 |
| YEAR | 11.0 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR. | | | | | | | | | | |
| 12... | 1430 | .5 | 8.1 | 25900 | 564 | 25 | 38 | 78 | 98 | 100 |
| 19... | 1715 | 3.0 | .10 | 40200 | 11 | 30 | 47 | 89 | 99 | 100 |
| 27... | 1700 | 10.0 | 2.5 | 25400 | 171 | 52 | 77 | 99 | 100 | -- |
| APR. | | | | | | | | | | |
| 01... | 1715 | 6.0 | 2.1 | 17600 | 100 | 50 | 70 | 98 | 100 | -- |
| 22... | 1545 | 7.0 | 1.4 | 7700 | 29 | 84 | 94 | 100 | -- | -- |
| MAY | | | | | | | | | | |
| 23... | 1030 | 8.0 | 3.6 | 28400 | 276 | 53 | 68 | 95 | 100 | -- |
| JUNE | | | | | | | | | | |
| 02... | 1415 | 18.5 | 6.6 | 56200 | 1000 | 57 | 72 | 91 | 98 | 100 |
| SEP. | | | | | | | | | | |
| 04... | 1215 | 13.0 | 8.3 | 35700 | 800 | 65 | 78 | 92 | 99 | 100 |
| 04... | 1700 | 20.0 | 4.3 | 28000 | 325 | 71 | 86 | 95 | 99 | 100 |

06207540 SILVER TIP CREEK NEAR BELFRY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | .09 | 1130 | .27 | .70 | 2160 | 4.1 | .30 | 760 | .62 |
| 2 | .10 | 1200 | .32 | .50 | 890 | 1.2 | .40 | 550 | .59 |
| 3 | .50 | 4290 | 5.8 | .18 | 1240 | .60 | .50 | 1400 | 1.9 |
| 4 | .66 | 6840 | 12 | .64 | 1690 | 2.9 | .40 | 800 | .86 |
| 5 | .62 | 1710 | 2.9 | 1.6 | 4530 | 20 | .30 | 560 | .45 |
| 6 | .66 | 1310 | 2.3 | 1.0 | 2850 | 7.7 | .40 | 795 | .86 |
| 7 | .62 | 1240 | 2.1 | .80 | 1990 | 4.3 | .50 | 1160 | 1.6 |
| 8 | .62 | 1650 | 2.8 | .66 | 1950 | 3.5 | .50 | 1620 | 2.2 |
| 9 | .70 | 1810 | 3.4 | .85 | 2640 | 6.1 | .40 | 790 | .85 |
| 10 | .90 | 4330 | 11 | 1.1 | 4090 | 12 | .35 | 560 | .53 |
| 11 | 1.2 | 4230 | 14 | .75 | 2560 | 5.2 | .20 | 685 | .37 |
| 12 | 1.3 | 3610 | 13 | 1.1 | 2850 | 8.5 | 0 | 0 | 0 |
| 13 | 1.3 | 4170 | 15 | .85 | 3510 | 8.1 | 0 | 0 | 0 |
| 14 | .66 | 1390 | 2.5 | .50 | 2040 | 2.8 | 0 | 0 | 0 |
| 15 | .34 | 1230 | 1.1 | .62 | 1870 | 3.1 | 0 | 0 | 0 |
| 16 | .66 | 1550 | 2.8 | 1.2 | 4890 | 16 | 0 | 0 | 0 |
| 17 | .66 | 1340 | 2.4 | .85 | 2990 | 6.9 | 0 | 0 | 0 |
| 18 | 1.1 | 3590 | 11 | 1.0 | 2580 | 7.0 | 0 | 0 | 0 |
| 19 | 1.1 | 4450 | 13 | 1.1 | 3230 | 9.6 | 0 | 0 | 0 |
| 20 | 1.3 | 3670 | 13 | 1.4 | 2700 | 10 | 0 | 0 | 0 |
| 21 | .70 | 1660 | 3.1 | .40 | 1280 | 1.4 | 0 | 0 | 0 |
| 22 | .62 | 2080 | 3.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | .50 | 1520 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | .66 | 1120 | 2.0 | .05 | 110 | .01 | 0 | 0 | 0 |
| 25 | .62 | 1170 | 2.0 | .30 | 2230 | 1.8 | 0 | 0 | 0 |
| 26 | .46 | 1160 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | .34 | 1370 | 1.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | .58 | 4340 | 6.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | 1.1 | 4290 | 13 | .10 | 220 | .06 | 0 | 0 | 0 |
| 30 | .90 | 3950 | 9.6 | .30 | 3260 | 2.6 | 0 | 0 | 0 |
| 31 | .90 | 3310 | 8.0 | -- | -- | -- | 0 | 0 | 0 |
| TOTAL | 22.47 | -- | 183.49 | 18.55 | -- | 145.47 | 4.25 | -- | 10.83 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | | | | 0 | 0 | 0 | .20 | 100 | .05 |
| 9 | | | | 0 | 0 | 0 | 3.0 | 350 | 2.8 |
| 10 | | | | 0 | 0 | 0 | 9.0 | 1010 | 25 |
| 11 | | | | 0 | 0 | 0 | 13 | 14700 | 516 |
| 12 | | | | .10 | 30 | .01 | 8.0 | 25900 | 559 |
| 13 | | | | 17 | 1870 | 86 | 4.5 | 22800 | 277 |
| 14 | | | | 16 | 6120 | 264 | 3.5 | 29900 | 283 |
| 15 | | | | 16 | 2460 | 106 | 2.5 | 32700 | 221 |
| 16 | | | | 5.0 | 2440 | 33 | 1.5 | 4500 | 18 |
| 17 | | | | 1.0 | 1070 | 2.9 | .50 | 1600 | 2.2 |
| 18 | | | | .90 | 995 | 2.4 | 0 | 0 | 0 |
| 19 | | | | .70 | 2410 | 4.6 | .10 | 22800 | 6.2 |
| 20 | | | | .50 | 995 | 1.3 | .30 | 36800 | 30 |
| 21 | | | | .40 | 410 | .44 | .20 | 5050 | 2.7 |
| 22 | | | | .30 | 390 | .32 | 0 | 0 | 0 |
| 23 | | | | .20 | 340 | .18 | 0 | 0 | 0 |
| 24 | | | | 0 | 0 | 0 | 1.0 | 19200 | 52 |
| 25 | | | | 0 | 0 | 0 | 2.3 | 19800 | 123 |
| 26 | | | | 0 | 0 | 0 | 2.3 | 21700 | 135 |
| 27 | | | | 0 | 0 | 0 | 2.5 | 24300 | 164 |
| 28 | | | | 0 | 0 | 0 | 2.1 | 22600 | 128 |
| 29 | | | | -- | -- | -- | 2.1 | 12800 | 73 |
| 30 | | | | -- | -- | -- | 2.1 | 14100 | 80 |
| 31 | | | | -- | -- | -- | 2.5 | 16700 | 113 |
| TOTAL | 0 | -- | 0 | 58.10 | -- | 501.15 | 63.20 | -- | 2810.95 |

06207540 SILVER TIP CREEK NEAR BELFRY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 2.1 | 17300 | 98 | 0 | 0 | 0 | 1.9 | 6150 | 32 |
| 2 | 2.5 | 9800 | 66 | 0 | 0 | 0 | 4.6 | 31500 | 391 |
| 3 | 1.4 | 10500 | 40 | 0 | 0 | 0 | 1.1 | 10600 | 31 |
| 4 | 1.3 | 13200 | 46 | 0 | 0 | 0 | .75 | 9500 | 19 |
| 5 | 1.3 | 14900 | 52 | .22 | 2210 | 1.3 | .08 | 2830 | 1.0 |
| 6 | 1.5 | 15000 | 61 | 0 | 0 | 0 | .04 | 4320 | .68 |
| 7 | 1.1 | 13400 | 40 | 0 | 0 | 0 | .22 | 6220 | 7.6 |
| 8 | .80 | 6750 | 15 | 0 | 0 | 0 | .31 | 8820 | 8.6 |
| 9 | .40 | 7600 | 8.2 | .16 | 1050 | .45 | .32 | 9070 | 9.8 |
| 10 | .30 | 12100 | 9.8 | 0 | 830 | 0 | .03 | 3520 | .29 |
| 11 | .20 | 3400 | 1.8 | 0 | 1180 | 0 | 0 | 0 | 0 |
| 12 | .30 | 2950 | 2.4 | .15 | 1750 | .71 | .05 | 2230 | 1.8 |
| 13 | .40 | 1250 | 1.4 | 0 | 0 | 0 | .01 | 5350 | .29 |
| 14 | .50 | 3900 | 5.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | .46 | 3410 | 4.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | .46 | 3300 | 4.1 | 0 | 0 | 0 | .11 | 2100 | 2.5 |
| 17 | .46 | 2910 | 3.6 | 0 | 0 | 0 | .19 | 5460 | 4.3 |
| 18 | .46 | 3800 | 4.7 | .40 | 2130 | 2.3 | .19 | 4220 | 4.7 |
| 19 | .42 | 3380 | 3.8 | .38 | 4100 | 4.2 | .38 | 6520 | 6.7 |
| 20 | .75 | 4090 | 8.3 | .33 | 3320 | 3.0 | .15 | 4180 | 2.4 |
| 21 | .80 | 3620 | 7.8 | .33 | 2010 | 1.8 | .06 | 2090 | .75 |
| 22 | 1.4 | 8050 | 30 | 4.9 | 21300 | 392 | .10 | 2780 | 1.6 |
| 23 | 1.7 | 7700 | 35 | 4.7 | 25600 | 386 | .18 | 3580 | 2.9 |
| 24 | 1.3 | 4320 | 15 | .92 | 5850 | 15 | .03 | 946 | .27 |
| 25 | 1.6 | 2910 | 13 | .56 | 4500 | 6.8 | .02 | 1080 | .17 |
| 26 | 1.9 | 8610 | 44 | .13 | 1970 | 1.2 | .06 | 2140 | .84 |
| 27 | 2.2 | 9470 | 56 | .09 | 2040 | .73 | .29 | 4370 | 3.8 |
| 28 | .54 | 2960 | 4.3 | .02 | 783 | 11 | .40 | 5720 | 6.2 |
| 29 | .05 | 1530 | .21 | 0 | 0 | 0 | .25 | 5400 | 3.6 |
| 30 | .14 | 1980 | .75 | .72 | 5320 | 11 | .35 | 3110 | 6.0 |
| 31 | -- | -- | -- | 1.5 | 7510 | 30 | -- | -- | -- |
| TOTAL | 28.74 | -- | 681.66 | 15.51 | -- | 856.60 | 12.17 | -- | 549.79 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE. (TONS/DAY) |
| 1 | .53 | 4080 | 5.9 | 0 | 0 | 0 | 1.1 | 3340 | 9.9 |
| 2 | .65 | 4100 | 7.2 | .04 | 250 | .34 | .54 | 1810 | 2.6 |
| 3 | 1.3 | 18100 | 64 | .05 | 281 | .30 | 2.7 | 4650 | 54 |
| 4 | .75 | 5700 | 12 | 0 | 0 | 0 | 7.4 | 23900 | 487 |
| 5 | .35 | 2710 | 4.0 | 0 | 0 | 0 | 1.5 | 9380 | 38 |
| 6 | .20 | 1760 | 2.5 | .88 | 2240 | 13 | .92 | 5860 | 15 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | .75 | 3750 | 7.6 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | .68 | 3520 | 6.5 |
| 9 | .19 | 904 | 1.6 | 0 | 0 | 0 | .58 | 3500 | 5.5 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | .32 | 1410 | 2.1 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | .40 | 2520 | 2.7 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | .05 | 283 | .28 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | .36 | 2230 | 2.4 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | .10 | 544 | .33 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | .44 | 3320 | 3.9 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | .58 | 2580 | 4.0 |
| 17 | .07 | 374 | .54 | 0 | 0 | 0 | 1.1 | 4390 | 13 |
| 18 | .04 | 260 | .25 | 0 | 0 | 0 | 1.1 | 5100 | 15 |
| 19 | 0 | 0 | 0 | .05 | 419 | .45 | 1.1 | 5690 | 17 |
| 20 | 0 | 0 | 0 | .09 | 608 | .58 | 1.4 | 7480 | 28 |
| 21 | 0 | 0 | 0 | .04 | 205 | .17 | 1.8 | 5520 | 27 |
| 22 | .16 | 975 | 1.7 | .12 | 907 | 1.1 | 1.2 | 5090 | 16 |
| 23 | .43 | 3410 | 5.0 | .12 | 597 | .56 | 1.3 | 6640 | 23 |
| 24 | .07 | 570 | .62 | 0 | 0 | 0 | 1.5 | 6650 | 27 |
| 25 | 0 | 0 | 0 | .24 | 1310 | 2.9 | 1.3 | 6070 | 21 |
| 26 | 0 | 0 | 0 | .34 | 1780 | 2.4 | 1.5 | 3020 | 12 |
| 27 | 0 | 0 | 0 | .25 | 1190 | 2.2 | 1.3 | 5600 | 20 |
| 28 | 0 | 0 | 0 | .44 | 1050 | 1.2 | 1.5 | 5150 | 21 |
| 29 | .23 | 1990 | 4.9 | .63 | 2390 | 6.0 | 1.4 | 4960 | 19 |
| 30 | .36 | 2780 | 4.6 | 1.9 | 5410 | 28 | 1.6 | 3200 | 14 |
| 31 | .12 | 900 | 1.1 | 1.1 | 3150 | 9.4 | -- | -- | -- |
| TOTAL | 5.45 | -- | 115.91 | 6.29 | -- | 68.60 | 37.52 | -- | 914.81 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 272.25
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 6839.26

06214050 CLARKS FORK YELLOWSTONE RIVER NEAR LAUREL, MONT.

LOCATION.--Lat 45°37'32", long 108°45'50", in SE¼SE¼ sec.28, T.2 S., R.24 E., Yellowstone County, at county bridge 3 miles south of Laurel and at mile 4.7.

DRAINAGE AREA.--2,783 sq mi.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1530 | 850 | 61 | 20 | 38 | -- | 3.2 | .1 | .5 |
| NOV. | | | | | | | | | |
| 20... | 1200 | 575 | 68 | 24 | -- | -- | 4.3 | -- | .7 |
| DEC. | | | | | | | | | |
| 14... | 1145 | 450 | 79 | 26 | -- | 200 | 3.0 | -- | .8 |
| JAN. | | | | | | | | | |
| 19... | 1215 | 530 | 65 | 22 | 31 | 130 | 2.1 | .3 | -- |
| FEB. | | | | | | | | | |
| 23... | 1030 | 500 | 76 | 28 | -- | 110 | 3.4 | .6 | -- |
| MAR. | | | | | | | | | |
| 16... | 1045 | 420 | 62 | 26 | -- | 210 | 7.6 | -- | -- |
| APR. | | | | | | | | | |
| 14... | 1000 | 670 | 56 | 18 | 28 | 110 | 2.0 | .5 | -- |
| MAY | | | | | | | | | |
| 13... | 1015 | 3000 | 29 | 8.2 | -- | 41 | 1.5 | -- | -- |
| JUNE | | | | | | | | | |
| 16... | 0830 | 7500 | 15 | 4.1 | -- | 16 | .6 | -- | -- |
| JULY | | | | | | | | | |
| 13... | 1000 | 3600 | 20 | 6.0 | 9.2 | 44 | .6 | .2 | -- |
| AUG. | | | | | | | | | |
| 12... | 1300 | 1200 | 39 | 15 | -- | 90 | 1.8 | -- | -- |
| SEP. | | | | | | | | | |
| 16... | 1000 | 850 | 53 | 20 | -- | 140 | 2.2 | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1530 | 850 | 0 | 0 | 70 | 1 | 0 | 0 | -- |
| DEC. | | | | | | | | | |
| 14... | 1145 | 450 | -- | -- | -- | -- | -- | -- | .00 |
| JAN. | | | | | | | | | |
| 19... | 1215 | 530 | 0 | 0 | 20 | 0 | 0 | 1 | .00 |
| MAR. | | | | | | | | | |
| 16... | 1045 | 420 | -- | -- | -- | -- | -- | -- | .01 |
| APR. | | | | | | | | | |
| 14... | 1000 | 670 | 0 | 0 | 60 | 0 | 0 | 5 | .00 |
| JULY | | | | | | | | | |
| 13... | 1000 | 3600 | 15 | 0 | 20 | 0 | 0 | 4 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 08... | 1530 | 850 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 19... | 1215 | 530 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 14... | 1000 | 670 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 13... | 1000 | 3600 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

06214050 CLARKS FORK YELLOWSTONE RIVER NEAR LAUREL, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

REMARKS.--Water discharge estimated from records for station 06208800, Clarks Fork Yellowstone River near Silesia.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 08... | -- | 384 | .52 | 881 | 240 | .08 | .020 | -- |
| NOV. | | | | | | | | |
| 20... | -- | 479 | .65 | 744 | 270 | .02 | .040 | 1.6 |
| DEC. | | | | | | | | |
| 14... | -- | 513 | .70 | 623 | 300 | .06 | .010 | 1.2 |
| JAN. | | | | | | | | |
| 19... | .10 | 376 | .51 | 538 | 250 | .00 | -- | 1.0 |
| FEB. | | | | | | | | |
| 23... | .40 | 534 | .73 | 721 | 300 | .02 | -- | 1.0 |
| MAR. | | | | | | | | |
| 16... | .30 | 530 | .72 | 601 | 260 | .34 | .38 | .2 |
| APR. | | | | | | | | |
| 14... | .30 | 292 | .40 | 528 | 210 | .32 | .19 | 2.1 |
| MAY | | | | | | | | |
| 13... | .10 | 150 | -- | 1220 | 110 | .06 | .60 | 1.2 |
| JUNE | | | | | | | | |
| 16... | .08 | 168 | .23 | 3400 | 54 | .07 | .30 | .6 |
| JULY | | | | | | | | |
| 13... | .08 | 118 | .16 | 1150 | 75 | .09 | .22 | 1.2 |
| AUG. | | | | | | | | |
| 12... | .16 | 264 | .36 | 855 | 160 | .06 | .12 | 1.1 |
| SEP. | | | | | | | | |
| 16... | .33 | 360 | .49 | 826 | 210 | .01 | .090 | 1.7 |

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 08... | 0 | 18 | .0 | 0 | 2 | 0 | 1 | 0 |
| DEC. | | | | | | | | |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | |
| 19... | 0 | 0 | -- | 0 | 0 | 3 | 0 | 10 |
| MAR. | | | | | | | | |
| 16... | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | |
| 14... | 0 | 0 | .1 | 3 | 8 | 0 | 0 | 20 |
| JULY | | | | | | | | |
| 13... | 7 | 67 | .0 | 8 | 1 | 34 | 0 | 8 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | |
| 19... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | |
| 14... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | |
| 13... | .00 | .00 | -- | -- | -- | -- | .05 | .00 | .00 |

06214050 CLARKS FORK YELLOWSTONE RIVER NEAR LAUREL, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 08... | 1530 | 8.0 | 11.0 | 630 | 12.4 | 7.9 | -- |
| NOV. | | | | | | | |
| 20... | 1200 | 2.0 | 6.0 | 810 | 12.0 | 8.2 | -- |
| DEC. | | | | | | | |
| 14... | 1145 | .0 | -1.5 | 690 | 12.4 | 8.2 | -- |
| JAN. | | | | | | | |
| 19... | 1215 | .5 | 7.5 | 640 | 10.2 | 7.9 | 130 |
| FEB. | | | | | | | |
| 23... | 1030 | .0 | 4.0 | 740 | 9.4 | 8.0 | 12 |
| MAR. | | | | | | | |
| 16... | 1045 | 3.0 | 5.0 | 1280 | 11.0 | 8.1 | 210 |
| APR. | | | | | | | |
| 14... | 1000 | 5.0 | 18.0 | 600 | 9.4 | -- | 100 |
| MAY | | | | | | | |
| 13... | 1015 | 12.0 | 19.0 | 255 | 8.4 | 8.2 | 2000 |
| JUNE | | | | | | | |
| 16... | 0830 | 11.0 | 16.5 | 160 | 8.6 | -- | 510 |
| JULY | | | | | | | |
| 13... | 1000 | 14.5 | 22.0 | 230 | 8.6 | 7.6 | 240 |
| AUG. | | | | | | | |
| 12... | 1300 | 23.0 | 32.0 | 400 | -- | 8.5 | 26 |
| SEP. | | | | | | | |
| 16... | 1000 | 10.0 | 7.0 | 580 | 8.2 | 8.1 | 150 |

06214100 YELLOWSTONE RIVER NEAR LAUREL, MONT.

LOCATION.--Lat 45°41'37", long 108°38'25", in NE¼ sec.4, T.2 S., R.25 E., Yellowstone County, at county bridge 5.4 miles downstream from Clarks Fork Yellowstone River, 6.6 miles east of Laurel, and at mile 358.3.

DRAINAGE AREA.--11,750 sq mi, approximately.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DISCHARGE (CFS) | DISSOLVED CALCIUM (CA) (MG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1330 | 5100 | 41 | 13 | 27 | -- | 5.7 | .3 | .2 |
| NOV. | | | | | | | | | |
| 20... | 1500 | 3800 | 42 | 14 | -- | -- | 7.3 | -- | .2 |
| DEC. | | | | | | | | | |
| 14... | 1400 | 3080 | 44 | 14 | -- | 84 | 5.6 | -- | .4 |
| JAN. | | | | | | | | | |
| 19... | 1500 | 4400 | 37 | 9.7 | 21 | 56 | 17 | .6 | -- |
| FEB. | | | | | | | | | |
| 23... | 1300 | 3200 | 47 | 14 | -- | 76 | 7.2 | .7 | -- |
| MAR. | | | | | | | | | |
| 16... | 1330 | 3000 | 42 | 14 | -- | 86 | 4.6 | -- | -- |
| APR. | | | | | | | | | |
| 14... | 1415 | 3800 | 41 | 13 | 23 | 72 | 4.8 | .6 | -- |
| MAY | | | | | | | | | |
| 13... | 1300 | 15200 | 26 | 6.6 | -- | 28 | 2.6 | -- | -- |
| JUNE | | | | | | | | | |
| 16... | 1200 | 41200 | 12 | 3.3 | -- | 11 | 1.4 | -- | -- |
| JULY | | | | | | | | | |
| 13... | 1400 | 23600 | 15 | 4.7 | 8.4 | 32 | 1.9 | .3 | -- |
| AUG. | | | | | | | | | |
| 12... | 1430 | 8000 | 22 | 7.1 | -- | 29 | 4.8 | -- | -- |
| SEP. | | | | | | | | | |
| 16... | 1300 | 6000 | 32 | 11 | -- | 52 | 4.6 | -- | -- |

06214100 YELLOWSTONE RIVER NEAR LAUREL, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

REMARKS.--Water discharge estimated from records for station 06214500, Yellowstone River at Billings.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 08... | -- | 256 | .35 | 3530 | 160 | .02 | .020 | 1.2 |
| NOV. | | | | | | | | |
| 20... | -- | 279 | .38 | 2860 | 160 | .02 | .020 | .5 |
| DEC. | | | | | | | | |
| 14... | -- | 293 | .40 | 2440 | 170 | .03 | .020 | 1.0 |
| JAN. | | | | | | | | |
| 19... | .10 | 224 | .30 | 2660 | 130 | -- | -- | 1.2 |
| FEB. | | | | | | | | |
| 23... | .20 | 294 | .40 | 2540 | 180 | .07 | -- | .8 |
| MAR. | | | | | | | | |
| 16... | .10 | 304 | .41 | 2460 | 160 | .35 | .11 | 1.3 |
| APR. | | | | | | | | |
| 14... | .20 | 222 | .30 | 2280 | 160 | .31 | .10 | 2.1 |
| MAY | | | | | | | | |
| 13... | .10 | 130 | -- | 5340 | 92 | .10 | .50 | 2.9 |
| JUNE | | | | | | | | |
| 16... | .04 | 90 | .12 | 10000 | 44 | .11 | .30 | 1.0 |
| JULY | | | | | | | | |
| 13... | .03 | 112 | .15 | 7140 | 57 | .07 | .20 | 1.2 |
| AUG. | | | | | | | | |
| 12... | .04 | 160 | .22 | 3460 | 84 | .07 | .070 | .9 |
| SEP. | | | | | | | | |
| 16... | .08 | 218 | .30 | 3530 | 130 | .01 | .090 | 1.6 |

06214100 YELLOWSTONE RIVER NEAR LAUREL, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1330 | 5100 | 0 | 0 | 70 | 1 | 0 | 0 | -- |
| DEC. | | | | | | | | | |
| 14... | 1400 | 3080 | -- | -- | -- | -- | -- | -- | .00 |
| JAN. | | | | | | | | | |
| 19... | 1500 | 4400 | 60 | 0 | 200 | 0 | 0 | 5 | .00 |
| MAR. | | | | | | | | | |
| 16... | 1330 | 3000 | -- | -- | -- | -- | -- | -- | .01 |
| APR. | | | | | | | | | |
| 14... | 1415 | 3800 | 10 | 7 | 170 | 1 | 0 | 2 | .00 |
| JULY | | | | | | | | | |
| 13... | 1400 | 23600 | 0 | 0 | 50 | 0 | 0 | 2 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 08... | 1330 | 5100 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 19... | 1500 | 4400 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 14... | 1415 | 3800 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 13... | 1400 | 23600 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 08... | 1330 | 7.5 | -- | 430 | 11.2 | 8.0 | -- |
| NOV. | | | | | | | |
| 20... | 1500 | 2.5 | 4.0 | 525 | 11.8 | 8.2 | -- |
| DEC. | | | | | | | |
| 14... | 1400 | .0 | .5 | 490 | 13.0 | 7.8 | -- |
| JAN. | | | | | | | |
| 19... | 1500 | .0 | 7.0 | 580 | 12.0 | 7.9 | 6 |
| FEB. | | | | | | | |
| 23... | 1300 | .0 | 7.0 | 440 | 10.2 | 8.1 | 8 |
| MAR. | | | | | | | |
| 16... | 1330 | 4.0 | 4.5 | 610 | 8.2 | 8.2 | 4 |
| APR. | | | | | | | |
| 14... | 1415 | 9.5 | 24.0 | 480 | 7.2 | -- | 48 |
| MAY | | | | | | | |
| 13... | 1300 | 13.5 | 27.5 | 215 | 8.0 | 8.1 | 620 |
| JUNE | | | | | | | |
| 16... | 1200 | 12.0 | 21.5 | 180 | 8.0 | -- | 470 |
| JULY | | | | | | | |
| 13... | 1400 | 15.5 | 25.0 | 175 | 8.6 | 7.7 | 180 |
| AUG. | | | | | | | |
| 12... | 1430 | 22.0 | 37.0 | 240 | 9.8 | 8.6 | 27 |
| SEP. | | | | | | | |
| 16... | 1300 | 11.0 | 10.0 | 350 | 8.0 | 8.2 | 110 |

06214100 YELLOWSTONE RIVER NEAR LAUREL, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. 08... | 0 | 10 | .0 | 0 | 1 | 0 | 0 | 0 |
| DEC. 14... | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. 19... | 0 | 0 | -- | 0 | 2 | 10 | 0 | 30 |
| MAR. 16... | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. 14... | 0 | 20 | .1 | 0 | 0 | 3 | 1 | 20 |
| JULY 13... | 4 | 38 | .1 | 0 | 2 | 0 | 0 | 0 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-T''ION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. 08... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 19... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. 14... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY 13... | .00 | .00 | -- | -- | -- | -- | .00 | .00 | .00 |

06214500 YELLOWSTONE RIVER AT BILLINGS, MONT.
(Irrigation network, pesticide and radiochemical station)

LOCATION.--Lat 45°46'23", long 108°28'32", in NE¼SW¼SE¼ sec.2, T.1 S., R.26 E., Yellowstone County, at city of Billings Water Department intake, 1 mile east of Billings, 1.8 miles upstream from gaging station at bridge on U.S. Highway 87, 11.8 miles upstream from Pryor Creek, and at mile 347.8.

DRAINAGE AREA.--11,783 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1950 to September 1958, July 1963 to September 1971.
Water temperatures: December 1950 to September 1958 (at highway bridge), July 1963 to September 1968 (at water department intake), October 1968 to September 1970 (at both sites), October 1970 to September 1971 (at water department intake).

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 06... | 1500 | 4930 | -- | 12 | 0 | 38 | 13 | 25 | 3.2 | 156 | 0 | 67 |
| NOV. | | | | | | | | | | | | |
| 02... | 1345 | 4180 | 3.5 | 14 | 70 | 37 | 13 | 28 | 3.1 | 153 | 0 | 76 |
| 30... | 1200 | 4160 | .5 | 16 | 20 | 38 | 12 | 25 | 2.8 | 147 | 0 | 74 |
| JAN. | | | | | | | | | | | | |
| 21... | 1545 | 4840 | .0 | 16 | 130 | 36 | 10 | 25 | 4.1 | 134 | 0 | 49 |
| FEB. | | | | | | | | | | | | |
| 09... | 1515 | 3110 | .5 | 17 | 110 | 41 | 11 | 26 | 3.5 | 155 | 0 | 58 |
| MAR. | | | | | | | | | | | | |
| 02... | 1415 | 2940 | .5 | 17 | 140 | 43 | 15 | 28 | 3.7 | 171 | 0 | 70 |
| APR. | | | | | | | | | | | | |
| 05... | 1330 | 3330 | 8.5 | 13 | 20 | 43 | 14 | 30 | 3.6 | 160 | -- | 88 |
| MAY | | | | | | | | | | | | |
| 10... | 1200 | 13700 | 12.5 | 15 | 80 | 24 | 7.1 | 11 | 3.3 | 104 | -- | 22 |
| JUNE | | | | | | | | | | | | |
| 08... | 1200 | 24400 | 15.0 | 14 | 70 | 16 | 5.0 | 7.3 | 1.2 | 74 | 0 | 19 |
| JULY | | | | | | | | | | | | |
| 08... | 1500 | 27000 | 14.5 | 12 | 40 | 15 | 5.2 | 10 | 1.7 | 76 | 0 | 22 |
| AUG. | | | | | | | | | | | | |
| 10... | 1300 | 8890 | 22.0 | 13 | 20 | 24 | 8.3 | 16 | 2.4 | 119 | 0 | 39 |
| SEP. | | | | | | | | | | | | |
| 02... | 1200 | 7440 | 18.5 | 15 | 20 | 30 | 10 | 19 | 2.7 | 146 | 0 | 46 |

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 06... | 1500 | 4930 | 10.0 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| NOV. | | | | | | | | | | |
| 02... | 1345 | 4180 | 3.5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 30... | 1200 | 4160 | .5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 21... | 1545 | 4840 | .0 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| FEB. | | | | | | | | | | |
| 09... | 1515 | 3110 | .5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAR. | | | | | | | | | | |
| 02... | 1415 | 2940 | .5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 05... | 1330 | 3330 | 8.5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAY | | | | | | | | | | |
| 10... | 1200 | 13700 | 12.5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JUNE | | | | | | | | | | |
| 08... | 1200 | 24400 | 15.0 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 08... | 1500 | 27000 | 14.5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| AUG. | | | | | | | | | | |
| 10... | 1300 | 8890 | -- | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SEP. | | | | | | | | | | |
| 02... | 1200 | 7440 | 18.5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 08... | 1100 | 5100 | 7.5 | 7 | 0 | 0 | 0 | 0 | .0 | 1 |

06214500 YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 541 micromhos Jan. 7; minimum daily, 122 micromhos June 22.
Water temperatures: Maximum, 24.0°C Aug. 7-9, 28; minimum, freezing point on many days during November to March.

Period of record:
Specific conductance: Maximum daily, 1,210 micromhos Feb. 2, 1951; minimum daily, 122 micromhos June 22, 1971.
Water temperatures: Maximum, 26.5°C July 24, 1955; minimum, freezing point on many days during winter periods.

REMARKS.--Temperature recorder stopped Apr. 5 to May 24. Thermograph records furnished by Montana Fish and Game Department. Miscellaneous periodic determinations of suspended-sediment data published for May to September 1951.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 06... | 5.9 | .5 | -- | 120 | 241 | .32 | 3140 | 150 | 18 | .9 | 386 | 8.2 |
| NOV. | | | | | | | | | | | | |
| 02... | 6.4 | .5 | -- | -- | 256 | .34 | 2860 | 140 | 19 | 1.0 | 399 | 7.5 |
| 30... | 6.3 | .5 | -- | 170 | 248 | .34 | 2840 | 140 | 24 | .9 | 386 | 7.4 |
| JAN. | | | | | | | | | | | | |
| 21... | 6.4 | .6 | .00 | -- | 210 | .29 | 2740 | 130 | 20 | 1.0 | 340 | 7.5 |
| FEB. | | | | | | | | | | | | |
| 09... | 6.3 | .6 | .00 | -- | 240 | .33 | 2020 | 150 | 23 | .9 | 392 | 7.9 |
| MAR. | | | | | | | | | | | | |
| 02... | 8.5 | .5 | .10 | 210 | 270 | .37 | 2140 | 170 | 30 | .9 | 440 | 8.6 |
| APR. | | | | | | | | | | | | |
| 05... | 7.9 | 1.0 | .20 | -- | 280 | .38 | 2520 | 160 | 34 | 1.0 | 429 | 8.1 |
| MAY | | | | | | | | | | | | |
| 10... | 3.6 | .3 | .20 | -- | 139 | .19 | 5140 | 89 | 4 | .5 | 225 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 08... | 2.0 | .4 | .32 | 20 | 103 | .14 | 6790 | 60 | 0 | .4 | 161 | 7.8 |
| JULY | | | | | | | | | | | | |
| 08... | 3.0 | .6 | .15 | 80 | 108 | .15 | 7870 | 59 | 0 | .6 | 179 | 8.0 |
| AUG. | | | | | | | | | | | | |
| 10... | 3.7 | .5 | .15 | -- | 166 | .23 | 3980 | 94 | 0 | .7 | 263 | 7.5 |
| SEP. | | | | | | | | | | | | |
| 02... | 4.8 | .8 | 1.2 | 160 | 206 | .28 | 4140 | 120 | 0 | .8 | 318 | 7.6 |

| DATE | ENDRIN (UG/L) | HEPTACHLOR (UG/L) | HEPTACHLOR EPOXIDE (UG/L) | MALATHION (UG/L) | PARATHION (UG/L) | DIAZINON (UG/L) | METHYL PARATHION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 06... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| NOV. | | | | | | | | | | |
| 02... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 30... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 21... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| FEB. | | | | | | | | | | |
| 09... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAR. | | | | | | | | | | |
| 02... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 05... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAY | | | | | | | | | | |
| 10... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JUNE | | | | | | | | | | |
| 08... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 08... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| AUG. | | | | | | | | | | |
| 10... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .04 | .00 | .00 |
| SEP. | | | | | | | | | | |
| 02... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

06214500 YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

RADIOCHEMICAL ANALYSES

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED NATURAL URANIUM (U) (UG/L) | DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L) | DIS-SOLVED GROSS ALPHA AS U-NAT. (PC/L) | DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 06... | 1500 | 4930 | 10.0 | 1.9 | 4.2 | 1.4 | 4.0 |
| NOV. | | | | | | | |
| 02... | 1345 | 4180 | 3.5 | 2.1 | 7.4 | 2.5 | 4.8 |
| 30... | 1200 | 4160 | .5 | 1.8 | <2.9 | <.1 | 3.2 |
| JUNE | | | | | | | |
| 14... | 0945 | 39300 | -- | .8 | 4.3 | 1.4 | 5.7 |

| DATE | DIS-SOLVED GROSS BETA AS CS-137 (PC/L) | TOTAL FILT-RABLE RESIDUE (MG/L) | SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L) | SUS-PENDED GROSS ALPHA AS U-NAT. (PC/L) | SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L) | SUS-PENDED GROSS BETA AS CS-137 (PC/L) | TOTAL NON-FILT-RABLE RESIDUE (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 06... | 5.0 | 250 | .5 | .2 | 1.0 | 1.1 | 9 |
| NOV. | | | | | | | |
| 02... | 6.0 | 250 | <.4 | <.1 | <.4 | .4 | 2 |
| 30... | 4.0 | 260 | .6 | .2 | .8 | .9 | 13 |
| JUNE | | | | | | | |
| 14... | 7.2 | 86 | 18 | 6.0 | 8.9 | 10 | 250 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 374 | 405 | 400 | 417 | 391 | 456 | 416 | 375 | 172 | 170 | 238 | 319 |
| 2 | 374 | 403 | 402 | 424 | 342 | 452 | 419 | 349 | 174 | 171 | 240 | 320 |
| 3 | --- | 402 | 400 | 442 | 337 | 457 | 419 | 341 | 180 | 162 | 240 | 314 |
| 4 | 384 | 405 | 403 | 451 | 344 | 456 | 438 | 337 | 174 | 160 | 246 | 350 |
| 5 | 386 | 405 | 416 | 467 | 358 | 433 | 438 | 299 | 172 | 145 | 240 | 338 |
| 6 | 394 | 414 | 416 | 499 | 389 | --- | 434 | 298 | 164 | 152 | 246 | 322 |
| 7 | 388 | 418 | 411 | 541 | 407 | --- | 432 | 284 | 163 | 153 | 256 | 317 |
| 8 | 388 | 418 | 414 | 505 | 375 | 438 | 417 | 279 | 162 | 152 | 256 | 312 |
| 9 | 388 | 408 | 418 | 491 | 429 | 420 | 399 | 246 | 153 | 153 | 256 | 309 |
| 10 | 388 | 403 | 414 | 479 | 418 | 408 | 381 | 240 | 148 | 161 | 258 | 308 |
| 11 | 393 | 417 | 416 | 472 | 395 | 412 | 372 | 227 | 147 | 154 | 258 | 310 |
| 12 | 389 | 419 | 431 | 472 | 401 | 421 | 368 | 227 | 163 | 162 | 258 | 316 |
| 13 | 399 | 419 | 426 | 487 | 387 | 439 | 361 | 225 | --- | 157 | 292 | 321 |
| 14 | 398 | 411 | 455 | 513 | 407 | 451 | 368 | 206 | 132 | 173 | 282 | 324 |
| 15 | 389 | 409 | 468 | 530 | 386 | 439 | 372 | 182 | 128 | 162 | 279 | 326 |
| 16 | 394 | 415 | 457 | 493 | 400 | 427 | 381 | 182 | 130 | 163 | 282 | 329 |
| 17 | 394 | 414 | 440 | 523 | 410 | 427 | 381 | 183 | 140 | 163 | 292 | 333 |
| 18 | 394 | 417 | 434 | 406 | 427 | 428 | 364 | 173 | 127 | 172 | 301 | 333 |
| 19 | 398 | 419 | 425 | 384 | 427 | 435 | 360 | 183 | 130 | 172 | 307 | 340 |
| 20 | 399 | 419 | 449 | 380 | 427 | 438 | 364 | 202 | 130 | 195 | 307 | 344 |
| 21 | 392 | 419 | 507 | 382 | 419 | 427 | 367 | 212 | 127 | 177 | 307 | 351 |
| 22 | 393 | 413 | 488 | 383 | 437 | 426 | 381 | 225 | 122 | 183 | 307 | 359 |
| 23 | 394 | 422 | 471 | 395 | 432 | 430 | 394 | 287 | 127 | 194 | 307 | 359 |
| 24 | 399 | 449 | 477 | 417 | 450 | 438 | 407 | 266 | 134 | 196 | 307 | 359 |
| 25 | 399 | 458 | 491 | 373 | 436 | 438 | 381 | 262 | 133 | 204 | 338 | 377 |
| 26 | 396 | 431 | 499 | 417 | 429 | 438 | 355 | 244 | 130 | 199 | 341 | 378 |
| 27 | 394 | 414 | 491 | 406 | 421 | 439 | 363 | 217 | 126 | 215 | 351 | 371 |
| 28 | 399 | 400 | 483 | 401 | 438 | 433 | 372 | 186 | 136 | 212 | 349 | 369 |
| 29 | 404 | 414 | 463 | 399 | --- | 417 | 367 | 181 | 148 | 220 | 347 | 368 |
| 30 | 404 | 395 | 442 | 420 | --- | 427 | 367 | 155 | 148 | 229 | 352 | 375 |
| 31 | 405 | --- | 425 | 395 | --- | 427 | --- | 155 | --- | 233 | 329 | --- |
| MONTH | 393 | 415 | 443 | 444 | 404 | 434 | 388 | 240 | 146 | 178 | 289 | 338 |
| YEAR | 342 | | | | | | | | | | | |

06214500 YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 14.5 | 13.0 | 5.5 | 4.5 | 1.5 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.0 |
| 2 | 14.5 | 13.0 | 5.0 | 3.5 | 1.5 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.5 |
| 3 | 14.5 | 12.0 | 3.5 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 | 0.5 | 0.0 | 0.5 | 0.0 |
| 4 | 15.0 | 13.0 | 3.5 | 1.5 | 1.0 | 0.0 | 0.5 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 5 | 14.5 | 13.0 | 4.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 6 | 13.5 | 9.5 | 5.0 | 4.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 | 0.0 | 0.0 |
| 7 | 9.5 | 8.0 | 5.5 | 4.5 | 1.5 | 1.0 | 0.0 | 0.0 | 1.0 | 0.5 | 0.5 | 0.0 |
| 8 | 9.0 | 8.0 | 6.0 | 5.0 | 3.0 | 1.5 | 0.0 | 0.0 | 0.5 | 0.0 | 0.5 | 0.0 |
| 9 | 8.0 | 6.5 | 6.0 | 5.0 | 3.0 | 1.5 | 0.0 | 0.0 | 0.5 | 0.5 | 1.5 | 0.5 |
| 10 | 8.5 | 7.0 | 6.0 | 5.5 | 1.5 | 0.5 | 0.0 | 0.0 | 0.5 | 0.0 | 1.5 | 0.5 |
| 11 | 9.0 | 8.0 | 5.5 | 5.0 | 0.5 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 2.0 | 0.5 |
| 12 | 8.5 | 8.0 | 5.5 | 4.5 | 1.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 3.0 | 0.5 |
| 13 | 8.0 | 7.0 | 5.0 | 4.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.5 | 4.5 | 3.0 |
| 14 | 8.0 | 6.5 | 4.5 | 4.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.5 | 5.0 | 4.0 |
| 15 | 8.0 | 6.0 | 4.5 | 3.5 | 1.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 5.0 | 4.0 |
| 16 | 8.5 | 6.5 | 5.0 | 4.0 | 1.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 4.0 | 3.5 |
| 17 | 8.0 | 6.5 | 5.5 | 4.5 | 0.5 | 0.5 | 0.0 | 0.0 | 0.5 | 0.5 | 3.5 | 2.0 |
| 18 | 8.5 | 7.0 | 5.5 | 4.5 | 1.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.0 | 3.0 | 1.5 |
| 19 | 8.5 | 6.5 | 4.5 | 4.0 | 1.0 | 0.5 | 0.0 | 0.0 | 0.5 | 0.0 | 4.0 | 2.0 |
| 20 | 8.5 | 6.5 | 4.0 | 3.0 | 1.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 3.5 |
| 21 | 8.5 | 8.0 | 3.0 | 1.5 | 2.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 1.5 |
| 22 | 8.0 | 6.5 | 1.5 | 0.0 | 3.0 | 2.0 | 0.0 | 0.0 | 0.5 | 0.0 | 1.5 | 1.0 |
| 23 | 8.0 | 6.5 | 0.0 | 0.0 | 3.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.5 |
| 24 | 7.0 | 6.5 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 1.5 |
| 25 | 7.0 | 5.5 | 0.0 | 0.0 | 2.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 3.5 |
| 26 | 5.5 | 4.5 | 0.0 | 0.0 | 2.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 4.5 |
| 27 | 5.0 | 3.5 | 0.0 | 0.0 | 2.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 5.5 |
| 28 | 4.0 | 2.0 | 0.0 | 0.0 | 1.5 | 1.5 | 0.0 | 0.0 | 0.5 | 0.0 | 7.0 | 6.0 |
| 29 | 4.0 | 3.0 | 0.0 | 0.0 | 1.5 | 1.5 | 0.5 | 0.0 | --- | --- | 8.5 | 6.0 |
| 30 | 5.5 | 3.5 | 1.0 | 0.0 | 1.5 | 1.0 | 0.5 | 0.5 | --- | --- | 9.5 | 7.0 |
| 31 | 5.5 | 4.5 | --- | --- | 1.0 | 1.0 | 0.5 | 0.0 | --- | --- | 8.5 | 5.5 |
| MONTH | 15.0 | 2.0 | 6.0 | 0.0 | 3.0 | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 9.5 | 0.0 |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 7.0 | 5.5 | --- | --- | 10.5 | 9.0 | 15.5 | 12.0 | 19.5 | 17.0 | 20.5 | 19.0 |
| 2 | 7.0 | 5.5 | --- | --- | 13.0 | 10.0 | 16.0 | 14.0 | 20.5 | 18.0 | 20.0 | 18.0 |
| 3 | 7.0 | 5.5 | --- | --- | 14.0 | 11.5 | 15.5 | 14.0 | 21.5 | 18.5 | 18.0 | 15.5 |
| 4 | 8.0 | 6.0 | --- | --- | 14.0 | 12.0 | 15.0 | 13.5 | 21.5 | 20.0 | 16.5 | 14.5 |
| 5 | --- | --- | --- | --- | 14.5 | 13.0 | 15.5 | 13.5 | 23.5 | 20.0 | 17.0 | 15.0 |
| 6 | --- | --- | --- | --- | 14.0 | 13.0 | 16.5 | 14.0 | 23.5 | 20.5 | 18.5 | 16.0 |
| 7 | --- | --- | --- | --- | 14.0 | 12.0 | 15.5 | 13.5 | 24.0 | 21.0 | 18.0 | 16.0 |
| 8 | --- | --- | --- | --- | 15.0 | 13.0 | 15.0 | 13.5 | 24.0 | 21.0 | 18.5 | 16.0 |
| 9 | --- | --- | --- | --- | 14.0 | 12.0 | 16.0 | 13.5 | 24.0 | 21.0 | 19.0 | 16.5 |
| 10 | --- | --- | --- | --- | 14.0 | 11.5 | 18.0 | 15.0 | 23.0 | 21.0 | 19.5 | 16.5 |
| 11 | --- | --- | --- | --- | 12.0 | 11.0 | 18.0 | 16.0 | 23.5 | 20.5 | 20.0 | 17.0 |
| 12 | --- | --- | --- | --- | 13.0 | 11.0 | 17.0 | 15.5 | 23.5 | 21.0 | 19.0 | 16.5 |
| 13 | --- | --- | --- | --- | 14.0 | 11.5 | 17.0 | 15.0 | 23.5 | 20.5 | 18.5 | 16.0 |
| 14 | --- | --- | --- | --- | 13.5 | 11.5 | 18.0 | 15.5 | 23.0 | 20.0 | 16.5 | 14.0 |
| 15 | --- | --- | --- | --- | 14.0 | 11.5 | 18.5 | 16.0 | 22.0 | 20.5 | 14.5 | 13.0 |
| 16 | --- | --- | --- | --- | 14.0 | 11.5 | 19.0 | 16.5 | 23.5 | 20.5 | 13.0 | 11.5 |
| 17 | --- | --- | --- | --- | 14.0 | 11.5 | 19.5 | 18.0 | 23.0 | 20.5 | 12.0 | 10.5 |
| 18 | --- | --- | --- | --- | 13.0 | 11.0 | 19.5 | 18.5 | 23.5 | 20.5 | 12.0 | 10.0 |
| 19 | --- | --- | --- | --- | 14.5 | 12.0 | 20.0 | 18.0 | 22.0 | 20.0 | 13.5 | 10.5 |
| 20 | --- | --- | --- | --- | 14.5 | 12.0 | 20.0 | 18.5 | 23.0 | 20.0 | 13.0 | 10.5 |
| 21 | --- | --- | --- | --- | 15.0 | 13.0 | 19.5 | 18.5 | 23.5 | 20.0 | 11.0 | 10.0 |
| 22 | --- | --- | --- | --- | 15.5 | 13.5 | 19.5 | 18.0 | 23.5 | 20.5 | 12.0 | 9.5 |
| 23 | --- | --- | --- | --- | 15.5 | 14.0 | 20.0 | 18.0 | 21.5 | 18.5 | 13.5 | 10.5 |
| 24 | --- | --- | --- | --- | 15.5 | 13.5 | 20.5 | 17.0 | 20.5 | 18.0 | 14.0 | 11.5 |
| 25 | --- | --- | 17.0 | 15.0 | 14.5 | 13.0 | 20.0 | 18.0 | 20.5 | 18.0 | 14.5 | 13.0 |
| 26 | --- | --- | 18.0 | 15.0 | 14.5 | 11.5 | 20.0 | 17.0 | 22.0 | 19.5 | 14.5 | 13.0 |
| 27 | --- | --- | 18.0 | 15.5 | 12.0 | 10.5 | 18.0 | 16.5 | 23.5 | 20.0 | 14.0 | 12.0 |
| 28 | --- | --- | 15.5 | 13.5 | 11.0 | 10.0 | 16.5 | 15.0 | 24.0 | 21.0 | 13.0 | 11.5 |
| 29 | --- | --- | 13.5 | 10.0 | 12.0 | 10.0 | 18.0 | 14.5 | 22.0 | 19.5 | 11.5 | 11.0 |
| 30 | --- | --- | 10.0 | 8.5 | 13.5 | 10.0 | 19.0 | 15.5 | 19.5 | 19.0 | 11.0 | 10.0 |
| 31 | --- | --- | 9.5 | 8.5 | --- | --- | 19.5 | 17.0 | 20.5 | 19.0 | --- | --- |
| MONTH | --- | --- | --- | --- | 15.5 | 9.0 | 20.5 | 12.0 | 24.0 | 17.0 | 20.5 | 9.5 |
| YEAR | 24.0 | 0.0 | | | | | | | | | | |

## 06217750 FLY CREEK AT POMPEYS PILLAR, MONT.

LOCATION.--Lat 45°59'33", long 107°57'07", in NW¼SE¼ sec.23, T.3 N., R.30 E., Yellowstone County, at gaging station at county bridge at Pompeys Pillar, 0.5 mile upstream from mouth.

DRAINAGE AREA.--285 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.
Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 2,190 mg/l Apr. 1-30, May 1-6; minimum, 232 mg/l Feb. 12-19.
Hardness: Maximum, 780 mg/l Apr. 1-30; minimum, 110 mg/l Feb. 12-19.

### CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-10 | -- | 26 | -- | 13 | -- | 75 | 51 | 160 | 4.8 | 299 | 0 | 440 |
| 11-31 | -- | 11 | -- | 15 | -- | 110 | 91 | 300 | 5.0 | 368 | 0 | 880 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 8.3 | -- | 17 | -- | 120 | 94 | 290 | 5.4 | 389 | 0 | 980 |
| DEC. | | | | | | | | | | | | |
| 01-17 | -- | 6.1 | -- | 17 | -- | 110 | 98 | 310 | 5.3 | 367 | 0 | 1000 |
| 18-31 | -- | 5.6 | -- | 17 | -- | 130 | 110 | 320 | 5.9 | 407 | 0 | 1100 |
| JAN. | | | | | | | | | | | | |
| 01-28 | -- | 7.0 | -- | 16 | 120 | 120 | 100 | 370 | 6.3 | 422 | 0 | 1100 |
| 30-31 | -- | 266 | -- | 6.0 | 220 | 30 | 13 | 53 | 5.8 | 118 | 0 | 130 |
| FEB. | | | | | | | | | | | | |
| 01-11 | -- | 20 | -- | 8.8 | 80 | 55 | 31 | 110 | 5.8 | 213 | -- | 340 |
| 12-19 | -- | 767 | -- | 5.0 | 120 | 27 | 9.7 | 30 | 5.3 | 80 | -- | 110 |
| 20-28 | -- | 36 | -- | 9.3 | 700 | 81 | 47 | 190 | 6.3 | 233 | -- | 640 |
| MAR. | | | | | | | | | | | | |
| 01-09 | -- | 18 | -- | 13 | 20 | 110 | 79 | 310 | 6.7 | 329 | -- | 940 |
| 10-15 | -- | 27 | -- | 12 | 40 | 82 | 60 | 280 | 7.2 | 277 | 0 | 820 |
| 16-31 | -- | 12 | -- | 12 | 20 | 120 | 87 | 400 | 6.5 | 366 | -- | 1100 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 9.0 | -- | 12 | 40 | 130 | 110 | 430 | 5.5 | 385 | 0 | 1300 |
| MAY | | | | | | | | | | | | |
| 01-06 | -- | 7.8 | -- | 10 | 10 | 120 | 110 | 440 | 5.4 | 357 | 0 | 1300 |
| 07-14 | -- | 46 | -- | 16 | 10 | 48 | 24 | 77 | 3.2 | 184 | 0 | 240 |
| 15-31 | -- | 47 | -- | 16 | 0 | 65 | 36 | 110 | 3.6 | 218 | 0 | 340 |
| JUNE | | | | | | | | | | | | |
| 01-16 | -- | 75 | -- | 14 | 10 | 43 | 24 | 68 | 2.4 | 155 | 0 | 230 |
| 17-30 | -- | 52 | -- | 14 | 10 | 59 | 37 | 120 | 2.9 | 211 | 0 | 360 |
| JULY | | | | | | | | | | | | |
| 01-09 | -- | 44 | -- | 16 | 10 | 57 | 35 | 110 | 3.2 | 224 | 0 | 300 |
| 10-18 | -- | 35 | -- | 14 | 10 | 70 | 42 | 130 | 3.8 | 286 | 0 | 380 |
| 19-31 | -- | 55 | -- | 15 | 10 | 58 | 34 | 89 | 3.7 | 236 | 0 | 290 |
| AUG. | | | | | | | | | | | | |
| 01-09 | -- | 71 | -- | 15 | 20 | 58 | 30 | 77 | 3.2 | 224 | 0 | 250 |
| 10-23 | -- | 40 | -- | 16 | 10 | 73 | 45 | 130 | 3.8 | 298 | 0 | 390 |
| 24-31 | -- | 49 | -- | 16 | 10 | 65 | 40 | 110 | 4.1 | 286 | 0 | 340 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 66 | -- | 15 | 0 | 53 | 28 | 73 | 3.0 | 222 | 0 | 210 |
| WTD. AVG. | -- | -- | -- | 11 | -- | 52 | 30 | 96 | 4.4 | 184 | 0 | 300 |
| TIME WTD. AVG. | -- | 47 | -- | 14 | -- | 88 | 64 | 221 | 4.7 | 300 | 0 | 678 |
| TONS PER DAY | -- | -- | -- | 1.4 | -- | 6.6 | 3.8 | 12 | .6 | 24 | 0 | 38 |

### ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 01... | 1545 | 7.4 | -- | 16 | 50 | 130 | 95 | 280 | 5.0 | 446 | 0 | 960 |
| MAR., 1971 | | | | | | | | | | | | |
| 04... | 1000 | 16 | .5 | 12 | 120 | 130 | 83 | 310 | 5.4 | 360 | 0 | 940 |
| JUNE | | | | | | | | | | | | |
| 15... | 1345 | 96 | 17.5 | 13 | 40 | 31 | 18 | 49 | 2.1 | 130 | 0 | 150 |
| SEP. | | | | | | | | | | | | |
| 08... | 0920 | 76 | 14.5 | 15 | 60 | 51 | 27 | 68 | 3.3 | 218 | 0 | 210 |

06217750 FLY CREEK AT POMPEYS PILLAR, MONT.--Continued

EXTREMES, 1970-71.--Continued
Specific conductance: Maximum daily, 3,220 micromhos Apr. 20; minimum daily, 262 micromhos Feb. 14.
Water temperatures: Maximum, 20.5°C Aug. 6-9; minimum, freezing point Feb. 26-28, Mar. 1, 2.

Period of record:
Dissolved solids: Maximum, 2,370 mg/l Apr. 15-27, 1969; minimum, 232 mg/l Feb. 12-19, 1971.
Hardness: Maximum, 802 mg/l Apr. 15-27, 1969; minimum, 110 mg/l Feb. 12-19, 1971.
Specific conductance: Maximum daily, 3,700 micromhos Apr. 30, 1969; minimum daily, 262 micromhos Feb. 14, 1971.
Water temperatures: Maximum, 20.5°C Aug. 6, 1970, Aug. 6-9, 1971; minimum , freezing point on many days during winter periods most years.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-10 | 11 | .5 | -- | -- | 895 | 1.22 | 63.0 | 390 | 150 | 3.5 | 1210 | 8.0 |
| 11-31 | 15 | .5 | -- | -- | 1600 | 2.31 | 50.5 | 640 | 330 | 5.2 | 2050 | 7.8 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 14 | .7 | -- | -- | 1710 | 2.46 | 40.6 | 670 | 350 | 4.8 | 2200 | 8.2 |
| DEC. | | | | | | | | | | | | |
| 01-17 | 18 | .4 | -- | -- | 1790 | 2.61 | 31.6 | 670 | 370 | 5.2 | 2340 | 8.2 |
| 18-31 | 20 | .5 | -- | -- | 1930 | 2.87 | 31.9 | 760 | 430 | 5.0 | 2540 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-28 | 23 | .6 | .10 | .05 | 1900 | 2.58 | 35.9 | 730 | 380 | 6.0 | 2510 | 8.3 |
| 30-31 | 5.5 | .2 | .10 | .10 | 240 | .33 | 172 | 130 | 33 | 2.0 | 489 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 01-11 | 7.9 | .4 | .10 | .03 | 664 | .90 | 35.9 | 260 | 90 | 2.9 | 938 | 8.1 |
| 12-19 | 3.1 | .4 | .40 | .21 | 232 | .32 | 480 | 110 | 42 | 1.3 | 344 | 8.3 |
| 20-28 | 14 | .4 | .20 | .18 | 1100 | 1.50 | 107 | 400 | 200 | 4.2 | 1450 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-09 | 24 | .4 | .10 | .03 | 1650 | 2.24 | 80.2 | 600 | 330 | 5.5 | 2340 | 8.1 |
| 10-15 | 19 | .3 | .10 | .09 | 1420 | 1.93 | 104 | 450 | 220 | 5.7 | 2010 | 8.4 |
| 16-31 | 28 | .4 | .00 | .03 | 1930 | 2.62 | 62.5 | 660 | 360 | 6.8 | 2710 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01-30 | 8.5 | .5 | .04 | .03 | 2190 | 2.98 | 53.2 | 780 | 460 | 6.7 | 2990 | 8.1 |
| MAY | | | | | | | | | | | | |
| 01-06 | 32 | .4 | .01 | .03 | 2190 | 2.98 | 46.1 | 750 | 460 | 7.0 | 2960 | 8.2 |
| 07-14 | 6.3 | .3 | .01 | .03 | 505 | .69 | 62.7 | 220 | 68 | 2.3 | 778 | 8.0 |
| 15-31 | 6.8 | .3 | .00 | .06 | 685 | .93 | 86.9 | 310 | 130 | 2.7 | 1040 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 01-16 | 9.6 | .7 | .35 | .09 | 470 | .64 | 95.2 | 210 | 79 | 2.1 | 699 | 7.9 |
| 17-30 | 8.1 | .8 | .01 | .06 | 706 | .96 | 99.1 | 300 | 130 | 3.0 | 1050 | 8.3 |
| JULY | | | | | | | | | | | | |
| 01-09 | 7.0 | .7 | 3.9 | .06 | 656 | .89 | 77.9 | 290 | 100 | 2.8 | 945 | 8.0 |
| 10-18 | 8.7 | .9 | .00 | .06 | 790 | 1.07 | 74.7 | 350 | 110 | 3.0 | 1160 | 8.1 |
| 19-31 | 6.6 | .6 | .02 | .03 | 613 | .83 | 91.0 | 280 | 91 | 2.3 | 927 | 8.1 |
| AUG. | | | | | | | | | | | | |
| 01-09 | 4.2 | .3 | .04 | .03 | 548 | .75 | 106 | 270 | 85 | 2.0 | 822 | 8.2 |
| 10-23 | 5.4 | .4 | .05 | .03 | 810 | 1.10 | 87.5 | 370 | 120 | 3.0 | 1160 | 8.2 |
| 24-31 | 5.5 | .4 | .15 | .06 | 722 | .98 | 95.5 | 330 | 92 | 2.6 | 1040 | 8.3 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 7.0 | .5 | .09 | .03 | 499 | .68 | 88.9 | 250 | 65 | 2.0 | 769 | 8.1 |
| WTD. AVG. | 6.9 | .5 | -- | -- | 590 | .81 | -- | 254 | 102 | 2.4 | 853 | 8.2 |
| TIME WTD. AVG. | 13 | .5 | -- | -- | 1230 | 1.71 | -- | 483 | 236 | 4.1 | 1690 | 8.1 |
| TONS PER DAY | .9 | .1 | -- | -- | 76 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 01... | 15 | .7 | -- | -- | 1730 | 2.52 | 37.0 | 720 | 350 | 4.6 | 2250 | 8.2 |
| MAR., 1971 | | | | | | | | | | | | |
| 04... | 24 | .4 | .10 | .08 | 1700 | 2.31 | 74.4 | 660 | 370 | 5.2 | 2320 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 15... | 3.7 | .4 | .11 | .06 | 332 | .45 | 86.1 | 150 | 45 | 1.7 | 532 | 7.7 |
| SEP. | | | | | | | | | | | | |
| 08... | 6.6 | .8 | .45 | .03 | 491 | .67 | 101 | 240 | 60 | 1.9 | 747 | 7.8 |

YELLOWSTONE RIVER BASIN

06217750 FLY CREEK AT POMPEYS PILLAR, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 05... | 1645 | 23 | .010 | -- | -- |
| NOV. | | | | | |
| 09... | 1550 | 8.5 | .000 | -- | -- |
| DEC. | | | | | |
| 01... | 1545 | 7.4 | .000 | 440 | -- |
| JAN., 1971 | | | | | |
| 14... | 1030 | 5.1 | .000 | -- | -- |
| FEB. | | | | | |
| 09... | 1215 | 9.8 | .000 | -- | -- |
| MAR. | | | | | |
| 04... | 1000 | 16 | .070 | 350 | 180 |
| APR. | | | | | |
| 13... | 1520 | 6.6 | .030 | -- | -- |
| MAY | | | | | |
| 07... | 1010 | 64 | .080 | -- | -- |
| JUNE | | | | | |
| 15... | 1345 | 96 | .050 | 80 | 0 |
| JULY | | | | | |
| 06... | 1520 | 49 | .070 | -- | -- |
| AUG. | | | | | |
| 02... | 1000 | 77 | .040 | -- | -- |
| SEP. | | | | | |
| 08... | 0920 | 76 | .070 | 230 | 0 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 801 | 2200 | 2270 | 2580 | 522 | 2090 | 2910 | 3090 | 648 | 894 | 725 | 724 |
| 2 | 1090 | 2190 | 2300 | 2600 | 570 | 2220 | 2910 | 3080 | 626 | 993 | 731 | 659 |
| 3 | 1150 | 2200 | 2290 | 2400 | 653 | 2270 | 3100 | 3080 | 581 | 930 | 734 | 701 |
| 4 | 1340 | 2190 | 2380 | 2580 | 823 | 2220 | 2980 | 3050 | 766 | 1020 | 788 | 712 |
| 5 | 1320 | 2190 | 2380 | 2550 | 944 | 2290 | 2970 | 2900 | 602 | 894 | 788 | 739 |
| 6 | 1740 | 2200 | 2460 | 2600 | 1130 | 2340 | 2980 | 2870 | 795 | 921 | 814 | 739 |
| 7 | 1660 | 2110 | 2480 | 2470 | 1320 | 2400 | 2980 | 670 | 776 | 959 | 848 | 708 |
| 8 | 1750 | 2270 | 2460 | 2400 | 1480 | 2340 | 3030 | 796 | 922 | 799 | 974 | 724 |
| 9 | 1750 | 2190 | 2310 | 2410 | 1680 | 2090 | 3030 | 769 | 760 | 952 | 971 | 697 |
| 10 | 1750 | 2150 | 2440 | 2190 | 1800 | 1710 | 2980 | 822 | 688 | 1160 | 1000 | 692 |
| 11 | 1950 | 2190 | 2480 | 2400 | 1910 | 1660 | 2910 | 952 | 720 | 1130 | 1150 | 741 |
| 12 | 2120 | 2220 | 2500 | 2400 | 598 | 1550 | 2880 | 695 | 590 | 1030 | 944 | 830 |
| 13 | 2110 | 2220 | 2500 | 2360 | 430 | 1950 | 2880 | 705 | 648 | 1150 | 1010 | 811 |
| 14 | 2120 | 2220 | 2590 | 2400 | 262 | 2060 | 2850 | 841 | 628 | 1150 | 956 | 783 |
| 15 | 2110 | 2270 | 2660 | 2270 | 288 | 2170 | 2880 | 1160 | 546 | 1100 | 1200 | 793 |
| 16 | 2150 | 2220 | 2640 | 2220 | 360 | 2340 | 2880 | 1020 | 640 | 1120 | 1230 | 793 |
| 17 | 2150 | 2190 | 2530 | 2210 | 394 | 2220 | 2910 | 1010 | 776 | 1290 | 907 | 815 |
| 18 | 2250 | 2270 | 2920 | 2400 | 549 | 2400 | 3060 | 1130 | 702 | 1110 | 1250 | 906 |
| 19 | 2200 | 2200 | 2530 | 2400 | 798 | 2440 | 3190 | 1570 | 802 | 989 | 1570 | 764 |
| 20 | 2250 | 2190 | 2480 | 2470 | 1130 | 2550 | 3220 | 1380 | 916 | 930 | 1400 | 777 |
| 21 | 2150 | 2190 | 2840 | 2470 | 1320 | 2480 | 3150 | 970 | 916 | 1120 | 1420 | 789 |
| 22 | 2150 | 2200 | 2680 | 2400 | 1560 | 2550 | 3090 | 1470 | 891 | 962 | 1440 | 823 |
| 23 | 2200 | 2340 | 2480 | 2400 | 1790 | 2620 | 3100 | 1190 | 946 | 1200 | 1400 | 793 |
| 24 | 2200 | 2450 | 2590 | 2530 | 1860 | 2660 | 3070 | 987 | 1090 | 1130 | 1160 | 751 |
| 25 | 2250 | 2550 | 2710 | 3090 | 1440 | 2660 | 3060 | 949 | 1480 | 975 | 1170 | 773 |
| 26 | 2200 | 2270 | 2530 | 3060 | 1520 | 2790 | 3060 | 894 | 1540 | 1130 | 1180 | 769 |
| 27 | 2200 | 2270 | 2710 | 2380 | 1800 | 2870 | 2880 | 820 | 1550 | 762 | 1170 | 769 |
| 28 | 2200 | 2270 | 2530 | 2180 | 1860 | 2900 | 2850 | 987 | 1540 | 797 | 1130 | 755 |
| 29 | 2280 | 2270 | 2590 | --- | --- | 2930 | 2910 | 987 | 1100 | 894 | 987 | 758 |
| 30 | 2300 | 2350 | 2500 | 449 | --- | 2930 | 3030 | 761 | 955 | 695 | 912 | 793 |
| 31 | 2280 | --- | 2680 | 542 | --- | 2900 | --- | 775 | --- | 695 | 838 | --- |
| MONTH | 1940 | 2240 | 2530 | 2330 | 1100 | 2370 | 2990 | 1370 | 871 | 996 | 1060 | 763 |
| YEAR | 1720 | | | | | | | | | | | |

06217750 FLY CREEK AT POMPEYS PILLAR, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.5 | 4.5 | 2.5 | 2.0 | 1.0 | 0.0 | 4.5 | 11.5 | 10.5 | 14.0 | 17.0 | 17.5 |
| 2 | 11.5 | 3.0 | 2.5 | 1.0 | 1.0 | 0.0 | 3.0 | 12.5 | 10.0 | 15.5 | 17.5 | 17.5 |
| 3 | 10.5 | 3.0 | 2.5 | 1.5 | 1.0 | 1.0 | 4.5 | 13.5 | 12.0 | 16.5 | 18.5 | 17.0 |
| 4 | 11.0 | 2.5 | 2.5 | 1.5 | 1.0 | 1.0 | 4.0 | 12.5 | 14.0 | 15.5 | 19.5 | 15.0 |
| 5 | 11.0 | 2.0 | 1.5 | 1.5 | 1.0 | 0.5 | 4.5 | 13.5 | 14.5 | 15.0 | 19.5 | 15.0 |
| 6 | 9.5 | 4.5 | 2.0 | 0.5 | 1.0 | 1.0 | 5.5 | 13.5 | 14.5 | 16.0 | 20.5 | 14.5 |
| 7 | 7.5 | 5.0 | 2.5 | 1.5 | 0.5 | 0.5 | 7.5 | 13.5 | 13.5 | 15.0 | 20.5 | 16.5 |
| 8 | 7.5 | 5.0 | 3.0 | 2.0 | 1.0 | 1.0 | 6.0 | 13.0 | 14.0 | 15.0 | 20.5 | 15.0 |
| 9 | 6.5 | 4.5 | 2.0 | 1.5 | 1.0 | 1.0 | 7.0 | 13.5 | 15.5 | 15.5 | 20.5 | 15.0 |
| 10 | 6.0 | 6.5 | 2.5 | 0.5 | 1.5 | 2.5 | 8.0 | 11.5 | 16.0 | 16.5 | 19.5 | 15.5 |
| 11 | 7.0 | 5.0 | 2.5 | 0.5 | 1.5 | 2.5 | 6.5 | 11.5 | 15.5 | 17.0 | 18.0 | 16.0 |
| 12 | 9.0 | 6.0 | 2.5 | 0.5 | 0.5 | 4.0 | 7.0 | 12.5 | 14.5 | 16.5 | 18.5 | 15.5 |
| 13 | 8.0 | 6.5 | 1.5 | 1.0 | 0.5 | 4.5 | 5.5 | 14.0 | 15.5 | 15.5 | 18.5 | 15.0 |
| 14 | 6.5 | 5.0 | 1.5 | 0.5 | 1.0 | 4.0 | 6.5 | 14.5 | 15.5 | 15.5 | 18.0 | 14.0 |
| 15 | 6.0 | 5.5 | 1.5 | 0.5 | 0.5 | 4.0 | 9.5 | 12.5 | 15.5 | 15.5 | 18.0 | 12.0 |
| 16 | 5.5 | 5.0 | 2.0 | 1.5 | 0.5 | 3.5 | 8.0 | 12.5 | 16.0 | 16.5 | 18.5 | 11.5 |
| 17 | 10.5 | 6.0 | 1.5 | 1.5 | 0.5 | 3.0 | 9.0 | 10.5 | 15.5 | 17.5 | 19.0 | 10.5 |
| 18 | 5.5 | 6.0 | 1.5 | 1.5 | 0.5 | 2.5 | 9.5 | 9.5 | 16.5 | 17.5 | 18.5 | 9.0 |
| 19 | 6.5 | 6.0 | 1.0 | 1.0 | 0.5 | 2.0 | 8.0 | 9.0 | 16.0 | 17.5 | 16.5 | 10.0 |
| 20 | 6.5 | 4.5 | 1.0 | 2.0 | 1.0 | 3.5 | 8.0 | 10.0 | 17.0 | 17.5 | 17.0 | 11.0 |
| 21 | 7.5 | 4.5 | 1.0 | 1.0 | 0.5 | 3.0 | 8.5 | 11.5 | 18.0 | 18.0 | 17.5 | 9.5 |
| 22 | 6.0 | 2.0 | 1.5 | 1.5 | 0.5 | 0.5 | 8.0 | 10.0 | 18.0 | 17.5 | 16.5 | 9.0 |
| 23 | 6.5 | 1.5 | 1.5 | 1.5 | 1.0 | 0.5 | 8.0 | 9.0 | 19.0 | 17.5 | 18.5 | 9.5 |
| 24 | 6.0 | 2.0 | 2.0 | 1.5 | 1.0 | 2.5 | 10.0 | 10.5 | 19.5 | 18.5 | 15.5 | 10.0 |
| 25 | 6.0 | 2.0 | 1.5 | 1.5 | 0.5 | 4.5 | 9.0 | 13.5 | 20.0 | 17.5 | 15.0 | 11.0 |
| 26 | 4.0 | 1.5 | 1.5 | 1.0 | 0.0 | 4.5 | 7.5 | 14.5 | 18.0 | 16.5 | 16.5 | 11.5 |
| 27 | 4.0 | 1.5 | 1.5 | 1.0 | 0.0 | 6.0 | 7.0 | 16.0 | 16.5 | 16.5 | 18.5 | 11.5 |
| 28 | 5.0 | 2.0 | 1.5 | 1.0 | 0.0 | 6.0 | 8.0 | 16.5 | 14.5 | 15.5 | 19.0 | 11.0 |
| 29 | 4.0 | 1.5 | 1.5 | --- | --- | 6.0 | 8.5 | 16.0 | 12.5 | 15.0 | 19.5 | 11.0 |
| 30 | 5.5 | 2.5 | 2.0 | 0.5 | --- | 7.0 | 9.5 | 12.5 | 13.0 | 15.0 | 18.5 | 11.0 |
| 31 | 4.5 | --- | 1.5 | 1.0 | --- | 6.5 | --- | 10.5 | --- | 16.0 | 17.0 | --- |
| MONTH | 7.0 | 4.0 | 2.0 | 1.0 | 0.5 | 3.0 | 7.0 | 12.5 | 15.5 | 16.5 | 18.5 | 13.0 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06279500 BIGHORN RIVER AT KANE, WYO.

LOCATION.--Lat 44°45'31", long 108°10'51", in NW¼NE¼SW¼ sec.9, T.55 N., R.94 W., Big Horn County, sampled at Magcobar Corp. bridge 24.5 miles upstream from gaging station.

DRAINAGE AREA.--15,765 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: March to August 1947, June 1948 to July 1949, December 1949 to September 1953, June 1955 to September 1957, December 1960 to September 1971.
Water temperatures: July to September 1949, October 1950 to September 1971.
Sediment records: March 1946 to September 1964, December 1969 to September 1971.

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 1,150 micromhos Oct. 10; minimum daily, 441 micromhos June 18.
Water temperatures: Maximum, 25.5°C Aug. 11; minimum, freezing point on many days during November to February.

### CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED SILICA (SIO2) (MG/L) | TOTAL IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) | DIS-SOLVED CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01... | 1220 | 1190 | -- | 20 | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 26... | 1340 | a1650 | -- | 27 | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 03... | 1300 | a2300 | 11 | 150 | 80 | 37 | 85 | 3.3 | 204 | 0 | 330 | 17 |
| APR. | | | | | | | | | | | | |
| 13... | 1530 | 2430 | 7.3 | 40 | 82 | 29 | 87 | 3.8 | 207 | 0 | 320 | 16 |
| MAY | | | | | | | | | | | | |
| 07... | 1700 | 3090 | 10 | 10 | 80 | 26 | 88 | 4.4 | 189 | 0 | 320 | 17 |
| JUNE | | | | | | | | | | | | |
| 25... | 1530 | 9920 | 9.9 | 190 | 43 | 11 | 35 | 2.4 | 116 | 0 | 120 | 7.2 |
| JULY | | | | | | | | | | | | |
| 02... | 1330 | 8420 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 15... | 1305 | 3170 | 10 | 110 | 60 | 18 | 59 | 2.7 | 165 | 0 | 210 | 8.3 |
| AUG. | | | | | | | | | | | | |
| 06... | 1245 | 1970 | 8.6 | 100 | 65 | 20 | 66 | 3.8 | 170 | 0 | 240 | 9.7 |
| SEP. | | | | | | | | | | | | |
| 15... | 1610 | 1710 | 10 | 220 | 74 | 22 | 69 | 3.3 | 183 | 0 | 260 | 11 |

a Daily mean discharge.

### SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1120 | 1080 | 1060 | --- | --- | 939 | 962 | 989 | 716 | 493 | 692 | 901 |
| 2 | 1130 | 1080 | --- | --- | --- | 929 | 976 | 975 | 740 | 515 | 693 | 837 |
| 3 | 1120 | 1080 | --- | --- | --- | 942 | 1020 | 986 | 699 | 519 | 714 | --- |
| 4 | 1120 | 1080 | --- | --- | --- | 939 | 985 | 973 | 650 | 608 | 744 | --- |
| 5 | 1130 | 1070 | --- | --- | --- | 936 | 991 | 946 | 633 | 557 | 746 | 861 |
| 6 | 1130 | 1060 | --- | --- | --- | 964 | 994 | 885 | 623 | 496 | 743 | 866 |
| 7 | 1130 | 1090 | 1030 | --- | --- | 961 | 975 | 850 | 628 | 497 | 763 | 843 |
| 8 | 1120 | 1100 | 1050 | --- | --- | 948 | --- | 842 | 629 | 495 | 747 | 811 |
| 9 | 1120 | 1100 | 1060 | --- | --- | 948 | 983 | 824 | 603 | 558 | 786 | 819 |
| 10 | 1150 | 1090 | 1020 | --- | --- | 949 | 983 | 819 | 506 | 548 | 765 | 793 |
| 11 | 1140 | 1080 | 1020 | --- | --- | 944 | 959 | 791 | 514 | 545 | 848 | --- |
| 12 | 1130 | 1080 | 1010 | --- | --- | 947 | 959 | 800 | 494 | 544 | 904 | 797 |
| 13 | 1130 | 1090 | 1040 | --- | --- | 973 | 940 | 812 | 492 | 586 | 888 | 846 |
| 14 | 1100 | 1090 | 1030 | --- | --- | 967 | 935 | 756 | 474 | --- | 893 | 791 |
| 15 | --- | 1080 | 1050 | --- | --- | --- | 946 | 677 | 472 | 626 | 893 | 821 |
| 16 | --- | 1080 | 1020 | --- | --- | --- | 938 | 674 | 453 | 609 | 885 | 797 |
| 17 | 1080 | 1070 | 1020 | --- | --- | --- | 930 | 706 | 462 | 612 | 888 | 823 |
| 18 | 1080 | 1080 | 982 | --- | --- | 974 | 946 | 758 | 441 | 626 | 900 | --- |
| 19 | 1080 | 1070 | 1080 | --- | 982 | 1030 | 926 | 802 | 482 | 616 | 919 | --- |
| 20 | 1070 | 1020 | 1090 | --- | 994 | 1090 | --- | 879 | 470 | 648 | 890 | 810 |
| 21 | 1060 | --- | 1120 | --- | 976 | 1010 | 937 | 882 | 444 | 604 | 890 | 814 |
| 22 | 1060 | 1010 | 1120 | --- | 973 | 959 | 965 | 933 | 499 | 608 | 885 | 814 |
| 23 | 1060 | 1060 | --- | --- | 954 | 967 | 970 | 939 | --- | 597 | 888 | 823 |
| 24 | 1080 | 1010 | --- | --- | --- | 965 | 1100 | 1020 | 884 | 445 | 575 | 885 | --- |
| 25 | 1080 | 1000 | --- | --- | --- | 964 | 1110 | --- | 822 | 454 | 572 | 891 | 816 |
| 26 | 1080 | 1050 | --- | --- | --- | 967 | --- | 1020 | 818 | 472 | 620 | 890 | 813 |
| 27 | 1070 | 1050 | --- | --- | --- | 970 | 1040 | 1020 | 768 | 472 | 602 | 913 | 807 |
| 28 | 1060 | 1040 | --- | --- | --- | 962 | 1020 | 1040 | 672 | 551 | 625 | 880 | 816 |
| 29 | 1050 | 1030 | --- | --- | --- | --- | 1040 | 1020 | --- | 456 | 662 | 903 | 805 |
| 30 | 1060 | 1030 | --- | --- | --- | --- | 1030 | 994 | 560 | 483 | 666 | 707 | 812 |
| 31 | 1070 | --- | --- | --- | --- | --- | 988 | --- | 649 | --- | --- | 1190 | --- |
| MONTH | 1100 | 1060 | --- | --- | --- | --- | 987 | 975 | 822 | 533 | 580 | 846 | 822 |
| YEAR | 873 | | | | | | | | | | | |

06279500 BIGHORN RIVER AT KANE, WYO.--Continued

EXTREMES.--Continued

Period of record:
Specific conductance (1955-57, 1960-71): Maximum daily, 3,030 micromhos July 7, 1961; minimum daily, 382 micromhos June 23, 1968.
Water temperatures: Maximum, 29.0°C July 14, 30, 1953, July 12, 1954; minimum, freezing point on many days during winter period.

REMARKS.--Temperature recorder at gaging station 24.5 miles downstream from sampling site July 3 to Sept. 30. No appreciable inflow between sampling point and gaging station except during periods of intense local precipitation. Stream frozen Dec. 23 to Feb. 18. Maximum water temperature recorded, 28.0°C Aug. 6, 12.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS_ SOLVED NITRATE (NO3) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) | TEMP-ERATURE (DEG C) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01... | -- | -- | 130 | -- | -- | -- | -- | -- | -- | -- | -- | 7.0 |
| JAN. | | | | | | | | | | | | |
| 26... | -- | -- | 110 | -- | -- | -- | -- | -- | -- | -- | -- | .0 |
| MAR. | | | | | | | | | | | | |
| 03... | .5 | 3.4 | 100 | 666 | .90 | 4120 | 350 | 183 | 2.0 | 910 | 8.2 | 2.0 |
| APR. | | | | | | | | | | | | |
| 13... | .6 | .5 | 100 | 644 | .89 | 4300 | 320 | 150 | 2.1 | 902 | 8.1 | 10.5 |
| MAY | | | | | | | | | | | | |
| 07... | .5 | 2.5 | 90 | 636 | .85 | 5210 | 300 | 145 | 2.2 | 854 | 7.9 | 17.0 |
| JUNE | | | | | | | | | | | | |
| 25... | .3 | 1.5 | 50 | 292 | .42 | 8250 | 150 | 55 | 1.2 | 446 | 7.7 | 21.0 |
| JULY | | | | | | | | | | | | |
| 02... | -- | -- | 60 | -- | -- | -- | -- | -- | -- | 529 | 7.9 | 20.0 |
| 15... | .4 | 1.5 | 150 | 449 | .63 | 3950 | 220 | 85 | 1.7 | 647 | 8.0 | 22.0 |
| AUG. | | | | | | | | | | | | |
| 06... | .5 | .6 | 80 | 495 | .70 | 2750 | 240 | 101 | 1.8 | 761 | 8.2 | 25.5 |
| SEP. | | | | | | | | | | | | |
| 15... | .6 | 1.3 | 100 | 547 | .78 | 2640 | 280 | 130 | 1.8 | 831 | 8.2 | 14.0 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (ONCE-DAILY RECORDS)

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.0 | 3.5 | 3.0 | --- | --- | 1.0 | 3.5 | 13.0 | 11.0 | 20.0 | 21.0 | 21.0 |
| 2 | 13.0 | 3.0 | --- | --- | --- | 1.5 | 4.0 | 17.5 | 12.0 | 20.0 | 25.0 | 20.5 |
| 3 | 12.5 | 3.0 | --- | --- | --- | 2.5 | 7.5 | 16.5 | 12.5 | 20.5 | --- | --- |
| 4 | 14.5 | 2.5 | --- | --- | --- | 3.5 | 8.5 | 17.0 | 14.0 | 20.0 | --- | --- |
| 5 | 14.0 | 2.5 | --- | --- | --- | 3.0 | 9.0 | 16.0 | 14.5 | 20.0 | --- | 17.5 |
| 6 | 9.5 | 2.5 | --- | --- | --- | 3.0 | 9.5 | 16.5 | 17.5 | 20.0 | --- | 17.0 |
| 7 | 8.5 | 5.5 | 1.5 | --- | --- | 3.5 | 10.5 | 16.5 | 17.5 | 20.5 | 24.0 | 19.0 |
| 8 | 8.5 | 7.0 | 2.0 | --- | --- | 2.0 | --- | 16.5 | 19.5 | 20.0 | 23.0 | 19.5 |
| 9 | 8.0 | 6.0 | 2.0 | --- | --- | 2.0 | 13.0 | 15.5 | 19.5 | 20.5 | 23.0 | 19.0 |
| 10 | 9.0 | 5.5 | 0.5 | --- | --- | 3.5 | 12.5 | 12.5 | 16.0 | 22.0 | 24.5 | 19.0 |
| 11 | 9.0 | 4.0 | 0.0 | --- | --- | 4.0 | 11.5 | 12.5 | 17.0 | 22.0 | 25.5 | --- |
| 12 | 7.0 | 4.5 | 0.0 | --- | --- | 3.0 | 9.5 | 13.0 | 18.0 | 22.0 | 25.0 | 16.5 |
| 13 | 6.5 | 4.0 | 0.0 | --- | --- | 6.0 | 10.5 | 12.0 | 18.0 | 22.0 | 24.0 | 16.0 |
| 14 | 6.0 | 4.0 | 0.0 | --- | --- | 5.5 | 11.0 | 12.5 | 18.5 | --- | 24.5 | 15.0 |
| 15 | --- | 3.0 | 0.0 | --- | --- | --- | 12.5 | 16.5 | 19.5 | 23.0 | 25.0 | 13.0 |
| 16 | --- | 4.5 | 0.0 | --- | --- | --- | 13.5 | 14.0 | 19.5 | 24.0 | 25.0 | 11.0 |
| 17 | 9.5 | 5.0 | 0.0 | --- | --- | --- | 13.5 | 15.5 | 19.5 | 25.0 | 24.5 | 9.0 |
| 18 | 9.5 | 4.5 | 0.0 | --- | --- | 5.5 | 9.5 | 12.5 | 19.0 | 21.0 | 25.0 | --- |
| 19 | 9.0 | 4.0 | 0.0 | --- | 1.0 | 5.0 | 7.0 | 12.5 | 16.0 | 23.0 | 25.0 | --- |
| 20 | 8.5 | 4.0 | 0.0 | --- | 2.5 | 6.0 | --- | 12.5 | 16.5 | 23.0 | 25.0 | 13.0 |
| 21 | 8.0 | --- | 0.0 | --- | 2.5 | 4.0 | 7.5 | 12.0 | 21.0 | 23.5 | 25.0 | 13.0 |
| 22 | 8.0 | 0.0 | 0.0 | --- | 2.5 | 4.0 | 8.0 | 13.0 | 21.5 | 23.5 | 21.0 | 12.0 |
| 23 | 8.0 | 0.0 | --- | --- | 3.0 | 5.5 | 8.5 | 13.5 | --- | 23.0 | 21.0 | 12.5 |
| 24 | 7.0 | 0.0 | --- | --- | 2.0 | 7.0 | 11.0 | 16.0 | 18.5 | 22.5 | 17.0 | --- |
| 25 | 7.0 | 1.5 | --- | --- | 1.0 | 6.5 | --- | 18.5 | 18.0 | 19.5 | 18.0 | 14.0 |
| 26 | 6.0 | 3.0 | --- | --- | 0.5 | --- | 8.5 | 18.5 | 18.5 | 21.0 | 18.5 | 13.0 |
| 27 | 5.0 | 1.5 | --- | --- | 1.5 | 7.5 | 9.5 | 19.0 | 19.0 | 20.5 | 19.5 | 15.0 |
| 28 | 4.5 | 2.5 | --- | --- | 1.5 | 8.5 | 11.0 | 19.0 | 17.5 | 20.5 | 25.0 | 14.0 |
| 29 | 4.5 | 3.0 | --- | --- | --- | 6.0 | 10.5 | --- | 17.5 | 22.0 | 20.0 | 13.5 |
| 30 | 6.5 | 3.0 | --- | --- | --- | 10.0 | 13.0 | 10.0 | 18.0 | 22.0 | 20.0 | 13.5 |
| 31 | 6.0 | --- | --- | --- | --- | 6.5 | --- | 10.0 | --- | --- | 21.0 | --- |
| MONTH | 8.5 | 3.5 | --- | --- | --- | 4.5 | 10.0 | 14.5 | 17.5 | 21.5 | 23.0 | 15.5 |
| YEAR | 12.0 | | | | | | | | | | | |

06279500 BIGHORN RIVER AT KANE, WYO.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (THERMOGRAPH RECORD)

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | --- | --- | --- | --- | 24.0 | 22.5 | 19.5 | 19.0 |
| 2 | --- | --- | --- | --- | --- | --- | --- | --- | 25.0 | 23.5 | 20.0 | 19.0 |
| 3 | --- | --- | --- | --- | --- | --- | 20.0 | 19.0 | 25.5 | 24.5 | 19.0 | 15.5 |
| 4 | --- | --- | --- | --- | --- | --- | 19.5 | 19.0 | 26.5 | 24.5 | 15.5 | 14.5 |
| 5 | --- | --- | --- | --- | --- | --- | 19.5 | 18.5 | 27.0 | 25.0 | 16.0 | 14.5 |
| 6 | --- | --- | --- | --- | --- | --- | 20.0 | 19.0 | 28.0 | 25.5 | 17.0 | 16.0 |
| 7 | --- | --- | --- | --- | --- | --- | 20.5 | 19.0 | 27.5 | 26.0 | 17.0 | 16.5 |
| 8 | --- | --- | --- | --- | --- | --- | 19.5 | 19.0 | 27.0 | 25.0 | 17.0 | 15.5 |
| 9 | --- | --- | --- | --- | --- | --- | 19.5 | 18.5 | 26.0 | 25.0 | 18.0 | 16.5 |
| 10 | --- | --- | --- | --- | --- | --- | 21.5 | 19.0 | 25.5 | 24.0 | 18.5 | 17.0 |
| 11 | --- | --- | --- | --- | --- | --- | 22.0 | 19.5 | 27.0 | 23.0 | 18.5 | 17.0 |
| 12 | --- | --- | --- | --- | --- | --- | 22.0 | 20.5 | 28.0 | 23.0 | 18.0 | 16.5 |
| 13 | --- | --- | --- | --- | --- | --- | 23.0 | 20.5 | 27.5 | 23.0 | 18.0 | 16.5 |
| 14 | --- | --- | --- | --- | --- | --- | 23.5 | 21.0 | 26.5 | 22.0 | 16.0 | 15.0 |
| 15 | --- | --- | --- | --- | --- | --- | 23.0 | 21.0 | 27.0 | 22.0 | 15.0 | 13.0 |
| 16 | --- | --- | --- | --- | --- | --- | 23.5 | 22.5 | 26.0 | 21.5 | 13.0 | 11.5 |
| 17 | --- | --- | --- | --- | --- | --- | 24.5 | 23.0 | 25.0 | 23.0 | 11.5 | 10.5 |
| 18 | --- | --- | --- | --- | --- | --- | 23.5 | 22.0 | 25.0 | 22.0 | 12.0 | 10.0 |
| 19 | --- | --- | --- | --- | --- | --- | 23.0 | 21.5 | 25.5 | 22.5 | 12.0 | 11.0 |
| 20 | --- | --- | --- | --- | --- | --- | 23.5 | 22.5 | 25.0 | 22.5 | 12.0 | 10.0 |
| 21 | --- | --- | --- | --- | --- | --- | 23.5 | 23.0 | 25.0 | 22.0 | 10.5 | 9.5 |
| 22 | --- | --- | --- | --- | --- | --- | 23.5 | 23.0 | 25.0 | 22.0 | 11.5 | 10.5 |
| 23 | --- | --- | --- | --- | --- | --- | 24.0 | 22.5 | 23.5 | 20.5 | 12.0 | 10.5 |
| 24 | --- | --- | --- | --- | --- | --- | 24.0 | 23.0 | 22.0 | 19.0 | 12.5 | 11.5 |
| 25 | --- | --- | --- | --- | --- | --- | 23.5 | 21.5 | 23.0 | 19.5 | 13.5 | 12.5 |
| 26 | --- | --- | --- | --- | --- | --- | 22.0 | 21.0 | 24.0 | 21.0 | 14.0 | 13.0 |
| 27 | --- | --- | --- | --- | --- | --- | 22.0 | 21.0 | 25.0 | 21.5 | 13.5 | 13.0 |
| 28 | --- | --- | --- | --- | --- | --- | 21.5 | 21.0 | 24.0 | 22.0 | 13.0 | 12.0 |
| 29 | --- | --- | --- | --- | --- | --- | 21.5 | 20.0 | 22.5 | 20.5 | 12.5 | 11.5 |
| 30 | --- | --- | --- | --- | --- | --- | 22.5 | 21.0 | 21.5 | 20.0 | 12.0 | 10.5 |
| 31 | --- | --- | --- | --- | --- | --- | 22.5 | 21.5 | 21.0 | 19.0 | --- | --- |
| MONTH | --- | --- | --- | --- | --- | --- | 24.5 | 18.5 | 28.0 | 19.0 | 20.0 | 9.5 |
| YEAR | 28.0 | 9.5 | | | | | | | | | | |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED AR-SENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BIS-MUTH (BI) (UG/L) | DIS-SOLVED BORON (B) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. 01... | 1220 | 1190 | 30 | 40 | 60 | <2 | <15 | 130 |
| JAN. 26... | 1340 | 1650 | 20 | 0 | 70 | <2 | <8 | 110 |
| APR. 13... | 1530 | 2430 | 70 | 60 | 40 | <3 | <12 | 70 |
| JULY 02... | 1330 | 8420 | -- | 0 | -- | 0 | -- | 10 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED LITH-IUM (LI) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MOLYB-DENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED RUBID-IUM (RB) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. 01... | 1220 | 1190 | <15 | 40 | 5 | <3 | <15 | <5 |
| JAN. 26... | 1340 | 1650 | <5 | 40 | 9 | 3 | <10 | 2 |
| APR. 13... | 1530 | 2430 | <12 | 30 | 9 | 4 | <24 | 4 |
| JULY 02... | 1330 | 8420 | -- | -- | 0 | 0 | -- | -- |

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | BED MAT. FALL DIAM. % FINER THAN .062 MM | BED MAT. FALL DIAM. % FINER THAN .125 MM | BED MAT. FALL DIAM. % FINER THAN .250 MM | BED MAT. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|
| APR. 13... | 1310 | 10.5 | 2500 | 0 | 0 | 25 | 85 |
| JUNE 25... | 1325 | 21.0 | 9870 | 0 | 1 | 22 | 55 |
| SEP. 15... | 1445 | 14.0 | 1830 | 0 | 1 | 20 | 30 |

06279500 BIGHORN RIVER AT KANE, WY0.--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM | SUS. SED. FALL DIAM. % FINER THAN 1.00 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 14... | 1200 | 7.5 | 1460 | 186 | 733 | -- | -- | -- | -- | -- | -- | -- |
| NOV. | | | | | | | | | | | | |
| 02... | 1610 | 5.0 | 1520 | 86 | 353 | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 02... | 1200 | 4.5 | 1750 | 186 | 879 | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 26... | 1340 | .0 | a1650 | 116 | 517 | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 03... | 1300 | 2.0 | a2300 | 688 | 4270 | 9 | 16 | 37 | 59 | 83 | 99 | 100 |
| APR. | | | | | | | | | | | | |
| 13... | 1310 | 10.5 | 2500 | 350 | 2360 | 22 | 32 | 51 | 65 | 96 | 100 | -- |
| MAY | | | | | | | | | | | | |
| 07... | 1700 | 17.0 | 3090 | 2500 | 20900 | 50 | 73 | 87 | 94 | 100 | -- | -- |
| JUNE | | | | | | | | | | | | |
| 09... | 1145 | 19.5 | 4890 | 1220 | 16100 | 15 | 25 | 57 | 79 | 97 | 100 | -- |
| 25... | 1325 | 21.0 | 9870 | 3140 | 83700 | 17 | 29 | 63 | 83 | 96 | 98 | 100 |
| JULY | | | | | | | | | | | | |
| 15... | 1305 | 22.0 | 3170 | 472 | 4040 | 24 | 37 | 70 | 90 | 100 | -- | -- |
| AUG. | | | | | | | | | | | | |
| 06... | 1245 | 25.5 | 1970 | 238 | 1270 | -- | -- | -- | -- | -- | -- | -- |
| SEP. | | | | | | | | | | | | |
| 15... | 1445 | 14.0 | 1830 | 164 | 810 | 44 | 60 | 81 | 90 | 100 | -- | -- |

a Daily mean discharge.

| DATE | DISSOLVED CADMIUM (CD) (UG/L) | DISSOLVED CHROMIUM (CR) (UG/L) | DISSOLVED COBALT (CO) (UG/L) | DISSOLVED COPPER (CU) (UG/L) | DISSOLVED GALLIUM (GA) (UG/L) | DISSOLVED GERMANIUM (GE) (UG/L) | DISSOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 01..... | <1 | <15 | <9 | 4 | ND[a] | <15 | 20 |
| JAN. | | | | | | | |
| 26..... | 0 | <8 | <8 | 4 | <5 | <10 | 30 |
| APR. | | | | | | | |
| 13..... | 0 | <12 | <5 | 1 | <12 | <12 | 70 |
| JULY | | | | | | | |
| 02..... | -- | -- | -- | -- | -- | -- | -- |

| DATE | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED TIN (SN) (UG/1) | DISSOLVED TITANIUM (TI) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) | DISSOLVED ZIRCONIUM (ZR) (UG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 01..... | <1 | 940 | <15 | <9 | <15 | 30 | ND[a] |
| JAN. | | | | | | | |
| 26..... | <0.5 | 930 | <8 | 7 | <5 | -- | <25 |
| APR. | | | | | | | |
| 13..... | <2 | 720 | <12 | <12 | <12 | 20 | <12 |
| JULY | | | | | | | |
| 02..... | -- | -- | -- | -- | -- | -- | -- |

a Specifically sought, not detected.

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | BED MAT. FALL DIAM. % FINER THAN 1.00 MM | BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM | BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM | BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM | BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM | BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM |
|---|---|---|---|---|---|---|
| APR. | | | | | | |
| 13... | 89 | 90 | 90 | 91 | 91 | 93 |
| JUNE | | | | | | |
| 25... | 59 | 60 | 61 | 63 | 69 | 86 |
| SEP. | | | | | | |
| 15... | 36 | 37 | 38 | 42 | 56 | 100 |

## 06287000 BIGHORN RIVER NEAR ST. XAVIER, MONT.

LOCATION.--Lat 45°19'00", long 107°55'05", in NW¼NE¼ sec.16, T.6 S., R.31 E., Big Horn County, at gaging station 800 ft downstream from Yellowtail afterbay dam, 1,500 ft downstream from Lime Kiln Creek, and 14 miles southwest of St. Xavier.

DRAINAGE AREA.--19,667 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1966 to September 1971.
Water temperatures: December 1962 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 656 mg/l Oct. 1-31; minimum, 322 mg/l Aug. 1-31.
Hardness: Maximum, 310 mg/l Oct. 1-31, Apr. 1-30; minimum, 160 mg/l Sept. 1-18.
Specific conductance: Maximum daily, 994 micromhos Oct. 7; minimum daily, 492 micromhos Aug. 28.
Water temperatures: Maximum, 18.0°C Aug. 15, 27; minimum, 1.0°C on many days during February and March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | -- | 2570 | -- | 12 | -- | 86 | 23 | 94 | 4.3 | 208 | 0 | 320 |
| NOV. | | | | | | | | | | | | |
| 02-30 | -- | 3160 | -- | 12 | -- | 75 | 24 | 80 | 4.4 | 196 | 0 | 290 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 4010 | -- | 11 | -- | 65 | 24 | 73 | 3.8 | 186 | 0 | 260 |
| JAN. | | | | | | | | | | | | |
| 01-30 | -- | 3820 | -- | 11 | 90 | 76 | 24 | 63 | 3.7 | 198 | 0 | 230 |
| FEB. | | | | | | | | | | | | |
| 04-28 | -- | 3540 | -- | 11 | 10 | 75 | 27 | 73 | 3.9 | 214 | -- | 270 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 4550 | -- | 12 | 10 | 76 | 26 | 80 | 4.8 | 230 | 2 | 280 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 5540 | -- | 11 | 10 | 77 | 28 | 79 | 3.8 | 216 | 0 | 280 |
| MAY | | | | | | | | | | | | |
| 01-31 | -- | 6990 | -- | 10 | 10 | 62 | 27 | 88 | 3.9 | 215 | 0 | 250 |
| JUNE | | | | | | | | | | | | |
| 01-30 | -- | 7960 | -- | 8.9 | 10 | 74 | 25 | 82 | 4.0 | 213 | 0 | 280 |
| JULY | | | | | | | | | | | | |
| 01-09 | -- | 6640 | -- | 9.4 | 10 | 56 | 19 | 65 | 3.2 | 178 | 0 | 220 |
| 10-19 | -- | 6450 | -- | 9.8 | 10 | 51 | 17 | 58 | 2.9 | 162 | 0 | 190 |
| 20-31 | -- | 5090 | -- | 9.9 | 10 | 46 | 15 | 49 | 2.4 | 146 | 0 | 160 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 3350 | -- | 11 | 10 | 45 | 13 | 40 | 2.0 | 137 | 0 | 140 |
| SEP. | | | | | | | | | | | | |
| 01-18 | -- | 2590 | -- | 12 | 0 | 44 | 13 | 42 | 2.5 | 136 | 0 | 140 |
| 19-23 | -- | 2590 | -- | 12 | 80 | 53 | 16 | 53 | 2.8 | 153 | 0 | 180 |
| 24-30 | -- | 2600 | -- | 11 | 0 | 65 | 21 | 78 | 4.0 | 182 | 0 | 260 |
| WTD. AVG. | -- | -- | -- | 11 | -- | 67 | 23 | 73 | 3.7 | 197 | 0 | 249 |
| TIME WTD. AVG. | -- | 4520 | -- | 11 | -- | 67 | 23 | 72 | 3.7 | 193 | 0 | 246 |
| TONS PER DAY | -- | -- | -- | 130 | -- | 824 | 285 | 896 | 45 | 2410 | 2 | 3040 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 01... | 1230 | 2760 | -- | 11 | 30 | 73 | 23 | 79 | 3.8 | 192 | 0 | 270 |
| MAR., 1971 | | | | | | | | | | | | |
| 16... | 1430 | 4430 | 3.0 | 14 | 140 | 82 | 27 | 79 | 3.8 | 263 | 0 | 280 |
| JUNE | | | | | | | | | | | | |
| 04... | 1315 | 8190 | 9.0 | 8.9 | 20 | 80 | 28 | 89 | 3.7 | 220 | 0 | 320 |
| SEP. | | | | | | | | | | | | |
| 10... | 1005 | 2570 | 17.0 | 11 | 10 | 43 | 14 | 43 | 2.5 | 146 | 0 | 140 |

06287000 BIGHORN RIVER NEAR ST. XAVIER, MONT.--Continued

EXTREMES.--Continued
Period of record:
Dissolved solids: Maximum, 842 mg/l Jan. 1-31, 1967; minimum, 322 mg/l Aug. 1-31, 1971.
Hardness: Maximum, 394 mg/l Mar. 1-31, 1967; minimum, 160 mg/l Sept. 1-18, 1971.
Specific conductance: Maximum daily, 1,180 micromhos on several days during 1966-67; minimum daily, 492 micromhos Aug. 28, 1971.
Water temperatures: Maximum, 24.5°C on several days during 1963-65; minimum, freezing point on many days during winter period most years prior to regulation.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Hardness, 320 mg/l Mar. 16. Thermograph records furinished by Montana Fish and Game Department. Flow regulated since Nov. 3, 1965, by Bighorn Lake.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-31 | 11 | .5 | -- | -- | 656 | .95 | 4870 | 310 | 140 | 2.3 | 969 | 7.9 |
| NOV. | | | | | | | | | | | | |
| 02-30 | 9.6 | .6 | -- | -- | 595 | .86 | 5380 | 290 | 130 | 2.1 | 854 | 8.0 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 9.6 | .3 | -- | -- | 543 | .77 | 6140 | 260 | 110 | 2.0 | 794 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-30 | 9.8 | .5 | .20 | .00 | 510 | .69 | 5260 | 290 | 130 | 1.6 | 823 | 8.3 |
| FEB. | | | | | | | | | | | | |
| 04-28 | 9.9 | .8 | .30 | .00 | 577 | .78 | 5520 | 300 | 120 | 1.8 | 852 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 13 | .4 | .10 | .03 | 608 | .83 | 7470 | 300 | 100 | 2.0 | 910 | 8.4 |
| APR. | | | | | | | | | | | | |
| 01-30 | 11 | .4 | .34 | .03 | 598 | .81 | 8950 | 310 | 130 | 2.0 | 919 | 8.2 |
| MAY | | | | | | | | | | | | |
| 01-31 | 11 | .4 | .32 | .03 | 560 | .76 | 10600 | 270 | 90 | 2.3 | 922 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 01-30 | 10 | .7 | .25 | .03 | 591 | .80 | 12700 | 290 | 110 | 2.1 | 890 | 8.1 |
| JULY | | | | | | | | | | | | |
| 01-09 | 8.4 | .8 | .25 | .00 | 470 | .64 | 8430 | 220 | 72 | 1.9 | 720 | 8.0 |
| 10-19 | 7.5 | .7 | .20 | .00 | 417 | .57 | 7260 | 200 | 64 | 1.8 | 639 | 7.8 |
| 20-31 | 6.6 | .8 | .09 | .06 | 362 | .49 | 4980 | 180 | 57 | 1.6 | 576 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 3.4 | .1 | .10 | .00 | 322 | .44 | 2910 | 170 | 53 | 1.4 | 517 | 7.8 |
| SEP. | | | | | | | | | | | | |
| 01-18 | 6.0 | .3 | .03 | .03 | 327 | .44 | 2290 | 160 | 52 | 1.4 | 515 | 8.1 |
| 19-23 | 7.8 | .3 | .10 | .03 | 401 | .55 | 2800 | 200 | 73 | 1.6 | 616 | 8.2 |
| 24-30 | 9.9 | .4 | .08 | .03 | 539 | .73 | 3780 | 250 | 99 | 2.2 | 809 | 8.1 |
| WTD. AVG. | 9.6 | .5 | -- | -- | 536 | .74 | -- | 267 | 102 | 2.0 | 821 | 8.1 |
| TIME WTD. AVG. | 9.4 | .5 | -- | -- | 529 | .73 | -- | 264 | 103 | 1.9 | 806 | 8.1 |
| TONS PER DAY | 118 | 6.1 | -- | -- | 6540 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 01... | 12 | .5 | -- | -- | 563 | .79 | 4320 | 280 | 120 | 2.1 | 812 | 7.8 |
| MAR., 1971 | | | | | | | | | | | | |
| 16... | 6.7 | .6 | .30 | .05 | 630 | .86 | 7540 | 320 | 100 | 1.9 | 899 | 7.3 |
| JUNE | | | | | | | | | | | | |
| 04... | 12 | .4 | .35 | .03 | 652 | .89 | 14400 | 310 | 130 | 2.2 | 930 | 7.9 |
| SEP. | | | | | | | | | | | | |
| 10... | 6.2 | .6 | .44 | .03 | 334 | .45 | 2320 | 160 | 45 | 1.5 | 517 | 7.7 |

06287000 BIGHORN RIVER NEAR ST. XAVIER, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 01... | 1130 | 1700 | .020 | -- | -- |
| NOV. | | | | | |
| 02... | 1300 | 3440 | .020 | -- | -- |
| DEC. | | | | | |
| 01... | 1230 | 2760 | .040 | 110 | -- |
| 31... | 1200 | 4650 | .050 | -- | -- |
| FEB., 1971 | | | | | |
| 04... | 1330 | 3540 | .000 | -- | -- |
| MAR. | | | | | |
| 16... | 1430 | 4430 | .050 | 170 | 130 |
| APR. | | | | | |
| 12... | 1115 | 5890 | .050 | -- | -- |
| MAY | | | | | |
| 12... | 1600 | 6450 | .050 | -- | -- |
| JUNE | | | | | |
| 04... | 1315 | 8190 | .020 | 90 | 0 |
| JULY | | | | | |
| 01... | 1300 | 7780 | .020 | -- | -- |
| AUG. | | | | | |
| 11... | 1000 | 3640 | .050 | -- | -- |
| SEP. | | | | | |
| 10... | 1005 | 2570 | .080 | 110 | 0 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 927 | --- | 835 | 806 | --- | 904 | 884 | 921 | 924 | 736 | 531 | 513 |
| 2 | 930 | 916 | 828 | 806 | --- | 906 | 892 | 929 | 924 | 730 | 531 | 508 |
| 3 | 953 | 916 | 814 | 806 | --- | 857 | 894 | 932 | 924 | 709 | 531 | 510 |
| 4 | 962 | 916 | 812 | 806 | 878 | 885 | 900 | 929 | 927 | 709 | 543 | --- |
| 5 | 962 | 916 | 819 | 808 | 903 | 906 | 900 | 921 | 924 | 691 | 523 | 511 |
| 6 | 981 | 907 | 812 | 817 | 903 | 909 | 897 | 921 | 924 | 686 | 524 | 513 |
| 7 | 994 | 907 | 817 | 782 | 914 | 906 | 900 | 921 | 924 | 681 | 521 | 513 |
| 8 | 981 | 894 | 819 | 784 | 903 | 906 | 897 | 906 | 924 | 678 | 513 | 507 |
| 9 | 981 | 894 | 819 | 850 | 914 | 885 | 897 | 912 | 921 | 678 | 506 | 504 |
| 10 | 971 | 894 | 819 | 858 | 900 | 882 | 894 | 921 | 919 | 647 | 505 | 510 |
| 11 | 981 | 894 | 817 | 866 | 870 | 845 | 897 | 921 | 897 | 647 | 498 | 504 |
| 12 | 981 | 871 | 817 | 866 | 870 | 880 | 900 | 921 | 897 | 647 | 506 | 500 |
| 13 | 971 | 891 | 819 | 881 | 870 | 885 | 921 | 912 | 897 | 645 | 502 | 504 |
| 14 | 942 | 894 | 819 | 881 | 886 | 882 | 910 | 912 | 894 | 642 | 515 | 509 |
| 15 | 959 | 847 | 817 | 824 | 870 | 882 | 921 | 929 | 897 | 629 | 519 | 507 |
| 16 | 962 | 856 | 814 | 817 | 850 | 882 | 921 | 921 | 892 | 629 | 499 | 502 |
| 17 | 981 | 866 | 828 | 817 | 875 | 896 | 921 | 912 | 884 | 613 | 498 | 513 |
| 18 | 984 | 869 | 835 | 848 | 923 | 912 | 930 | 929 | 866 | 602 | 506 | 523 |
| 19 | 971 | 871 | 821 | 848 | 926 | 904 | 938 | 929 | 850 | 602 | 497 | 558 |
| 20 | 959 | 864 | 819 | 829 | 923 | 885 | 924 | 921 | 850 | 590 | 498 | 558 |
| 21 | 962 | 856 | 819 | 829 | 929 | 882 | 924 | 906 | 843 | 578 | 498 | 602 |
| 22 | --- | 871 | 797 | 803 | 929 | 906 | 938 | 909 | 843 | 578 | 498 | 652 |
| 23 | --- | 844 | 790 | 806 | 875 | 896 | 927 | 929 | 813 | 567 | 498 | 690 |
| 24 | 953 | 844 | 795 | 806 | 828 | 912 | 921 | 921 | 813 | 577 | 502 | 795 |
| 25 | 950 | 844 | 795 | 808 | 873 | 932 | 927 | 929 | 792 | 563 | 498 | 803 |
| 26 | 927 | 840 | 795 | 853 | 873 | 912 | 938 | 932 | 763 | 563 | 495 | 803 |
| 27 | 930 | 847 | 795 | 853 | 870 | 906 | 924 | 921 | 763 | 563 | 497 | 817 |
| 28 | 930 | 847 | 790 | 826 | 875 | 906 | 924 | 932 | 764 | 555 | 492 | 808 |
| 29 | 924 | 833 | 790 | 826 | --- | 870 | 924 | 932 | 772 | 553 | 506 | 824 |
| 30 | 924 | 833 | 790 | 829 | --- | 882 | 921 | 935 | 753 | 547 | 499 | 829 |
| 31 | 924 | --- | 790 | --- | --- | 888 | --- | 921 | --- | 547 | 513 | --- |
| MONTH | 957 | 874 | 811 | 828 | 889 | 893 | 914 | 922 | 866 | 625 | 508 | 600 |
| YEAR | 805 | | | | | | | | | | | |

06287000 BIGHORN RIVER NEAR ST. XAVIER, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 13.5 | 13.5 | 10.5 | 10.0 | 8.5 | 8.0 | 5.0 | 5.0 | 3.0 | 2.0 | 1.5 | 1.0 |
| 2 | 14.0 | 13.5 | 10.0 | 10.0 | 8.5 | 8.5 | 5.0 | 5.0 | 2.0 | 2.0 | 1.5 | 1.0 |
| 3 | 14.0 | 13.5 | 10.0 | 10.0 | 8.5 | 8.0 | 5.0 | 4.5 | 2.0 | 2.0 | 1.5 | 1.0 |
| 4 | 14.0 | 13.5 | 10.0 | 10.0 | 8.5 | 8.5 | 4.5 | 4.5 | 2.0 | 2.0 | 1.5 | 1.0 |
| 5 | 14.0 | 13.5 | 10.0 | 10.0 | 8.5 | 8.0 | 4.5 | 4.5 | 2.0 | 2.0 | 1.5 | 1.0 |
| 6 | 13.5 | 13.5 | 10.5 | 10.0 | 8.5 | 8.5 | 4.5 | 4.0 | 2.0 | 1.5 | 1.5 | 1.0 |
| 7 | 13.5 | 13.0 | 10.0 | 10.0 | 8.5 | 8.5 | 4.0 | 4.0 | 1.5 | 1.5 | 1.5 | 1.0 |
| 8 | 13.5 | 13.0 | 10.0 | 9.5 | 8.5 | 8.0 | 4.0 | 4.0 | 2.0 | 1.5 | 1.5 | 1.0 |
| 9 | 13.5 | 13.0 | 10.0 | 9.5 | 8.0 | 8.0 | 4.0 | 4.0 | 2.0 | 1.5 | 1.5 | 1.0 |
| 10 | 13.0 | 13.0 | 10.0 | 10.0 | 8.0 | 7.0 | 4.0 | 4.0 | 2.0 | 1.5 | 1.5 | 1.0 |
| 11 | 13.5 | 13.0 | 10.0 | 10.0 | 8.0 | 7.0 | 4.0 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 |
| 12 | 13.5 | 13.0 | 10.0 | 10.0 | 8.0 | 7.0 | 4.0 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 |
| 13 | 13.0 | 13.0 | 10.0 | 9.5 | 8.0 | 7.0 | 4.0 | 3.5 | 2.0 | 1.5 | 1.5 | 1.5 |
| 14 | 13.5 | 13.0 | 10.0 | 9.5 | 7.0 | 7.0 | 3.5 | 3.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 15 | 13.5 | 13.0 | 10.0 | 9.5 | 7.0 | 7.0 | 4.0 | 3.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 16 | 13.5 | 13.0 | 10.0 | 9.5 | 7.0 | 7.0 | 3.5 | 3.5 | 2.0 | 1.5 | 1.5 | 1.0 |
| 17 | 13.5 | 13.0 | 9.5 | 9.5 | 7.0 | 6.5 | 3.5 | 3.5 | 1.5 | 1.5 | 1.0 | 1.0 |
| 18 | 13.5 | 13.0 | 9.5 | 9.0 | 6.5 | 6.0 | 4.0 | 3.5 | 1.5 | 1.5 | 1.5 | 1.0 |
| 19 | 13.0 | 13.0 | 9.0 | 8.5 | 6.0 | 6.0 | 4.0 | 3.5 | 1.5 | 1.5 | 1.5 | 1.0 |
| 20 | 13.5 | 13.0 | 9.0 | 8.5 | 6.0 | 6.0 | 3.5 | 3.0 | 1.5 | 1.5 | 1.5 | 1.0 |
| 21 | 13.0 | 12.0 | 8.5 | 8.0 | 6.0 | 6.0 | 3.0 | 3.0 | 1.5 | 1.0 | 1.5 | 1.0 |
| 22 | 13.0 | 12.0 | 8.0 | 8.0 | 6.0 | 5.5 | 3.0 | 3.0 | 1.5 | 1.5 | 1.5 | 1.0 |
| 23 | 12.0 | 11.5 | 8.0 | 8.0 | 6.0 | 5.5 | 3.0 | 3.0 | 1.5 | 1.5 | 1.5 | 1.0 |
| 24 | 12.0 | 11.5 | 9.0 | 8.0 | 6.0 | 5.5 | 3.0 | 3.0 | 1.5 | 1.5 | 1.0 | 1.0 |
| 25 | 11.5 | 11.5 | 9.0 | 8.0 | 5.5 | 5.5 | 3.0 | 3.0 | 1.5 | 1.5 | 1.0 | 1.0 |
| 26 | 11.5 | 11.0 | 8.5 | 8.0 | 5.5 | 5.5 | 3.5 | 3.0 | 1.5 | 1.5 | 1.5 | 1.0 |
| 27 | 11.0 | 10.5 | 8.0 | 8.0 | 5.5 | 5.5 | 3.5 | 3.0 | 1.5 | 1.0 | 1.5 | 1.0 |
| 28 | 11.0 | 10.5 | 8.0 | 8.0 | 5.5 | 5.5 | 3.0 | 3.0 | 1.5 | 1.0 | 1.5 | 1.0 |
| 29 | 10.5 | 10.5 | 8.5 | 8.0 | 5.5 | 5.0 | 3.0 | 2.0 | --- | --- | 1.5 | 1.0 |
| 30 | 10.5 | 10.5 | 8.5 | 8.5 | 5.0 | 5.0 | 3.0 | 2.0 | --- | --- | 2.0 | 1.5 |
| 31 | 10.5 | 10.0 | --- | --- | 5.0 | 5.0 | 3.0 | 3.0 | --- | --- | 1.5 | 1.5 |
| MONTH | 14.0 | 10.0 | 10.5 | 8.0 | 8.5 | 5.0 | 5.0 | 2.0 | 3.0 | 1.0 | 2.0 | 1.0 |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 1.5 | 1.5 | 3.5 | 3.0 | 7.0 | 6.5 | 13.5 | 13.0 | 16.5 | 16.0 | 17.0 | 17.0 |
| 2 | 1.5 | 1.5 | 3.5 | 3.0 | 8.0 | 6.5 | 13.5 | 13.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 3 | 1.5 | 1.5 | 3.5 | 3.0 | 8.0 | 7.0 | 13.5 | 13.0 | 17.0 | 16.5 | 16.5 | 16.5 |
| 4 | 1.5 | 1.5 | 3.5 | 3.0 | 8.0 | 7.0 | 13.5 | 13.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 5 | 2.0 | 1.5 | 4.0 | 3.0 | 9.0 | 8.0 | 14.0 | 13.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 6 | 2.0 | 1.5 | 3.5 | 3.0 | 9.0 | 8.5 | 14.0 | 13.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 7 | 2.0 | 1.5 | 4.0 | 3.5 | 9.5 | 9.0 | 14.0 | 13.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 8 | 2.0 | 2.0 | 4.0 | 3.5 | 9.5 | 9.0 | 14.0 | 14.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 9 | 2.0 | 1.5 | 3.5 | 3.5 | 10.0 | 9.5 | 14.5 | 14.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 10 | 3.0 | 2.0 | 4.0 | 3.5 | 10.0 | 9.5 | 15.0 | 14.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 11 | 3.0 | 2.0 | 4.0 | 3.5 | 10.0 | 9.5 | 15.0 | 14.5 | 17.0 | 16.5 | 17.0 | 17.0 |
| 12 | 2.0 | 2.0 | 4.0 | 3.5 | 10.5 | 10.0 | 15.0 | 14.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 13 | 3.0 | 2.0 | 4.0 | 3.5 | 10.5 | 10.0 | 15.0 | 15.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 14 | 3.0 | 2.0 | 4.5 | 3.5 | 10.5 | 10.5 | 15.0 | 15.0 | 17.0 | 16.5 | 17.0 | 16.5 |
| 15 | 3.0 | 2.0 | 4.0 | 3.5 | 11.0 | 10.5 | 15.5 | 15.0 | 18.0 | 16.5 | 16.5 | 16.5 |
| 16 | 3.0 | 2.0 | 4.0 | 3.5 | 11.0 | 11.0 | 15.5 | 15.0 | 17.0 | 16.5 | 16.5 | 16.0 |
| 17 | 3.0 | 2.0 | 4.0 | 3.5 | 11.5 | 11.0 | 15.5 | 15.5 | 17.0 | 16.5 | 16.5 | 16.0 |
| 18 | 3.0 | 2.0 | 4.0 | 3.5 | 11.5 | 11.0 | 15.5 | 15.5 | 17.0 | 16.5 | 16.5 | 16.0 |
| 19 | 2.0 | 2.0 | 4.0 | 4.0 | 11.5 | 11.0 | 16.0 | 15.5 | 17.0 | 16.5 | 16.5 | 16.0 |
| 20 | 3.0 | 2.0 | 4.5 | 4.0 | 11.5 | 11.0 | 16.0 | 15.5 | 17.0 | 16.5 | 16.0 | 16.0 |
| 21 | 3.0 | 2.0 | 4.0 | 4.0 | 12.0 | 11.5 | 16.0 | 15.5 | 17.0 | 16.5 | 16.5 | 16.0 |
| 22 | 3.0 | 2.0 | 4.5 | 4.0 | 12.0 | 11.5 | 16.0 | 15.5 | 17.0 | 17.0 | 16.5 | 16.0 |
| 23 | 3.0 | 2.0 | 5.0 | 4.5 | 12.0 | 11.5 | 16.0 | 15.5 | 17.0 | 16.5 | 17.0 | 16.0 |
| 24 | 3.0 | 2.0 | 5.0 | 4.5 | 12.0 | 11.5 | 16.0 | 15.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 25 | 3.0 | 3.0 | 5.5 | 5.0 | 12.0 | 11.5 | 16.0 | 15.5 | 17.0 | 16.5 | 17.0 | 16.5 |
| 26 | 3.0 | 3.0 | 5.5 | 5.0 | 12.0 | 11.5 | 16.5 | 15.5 | 17.0 | 16.5 | 16.5 | 16.0 |
| 27 | 3.0 | 3.0 | 5.5 | 5.0 | 12.0 | 12.0 | 16.0 | 16.0 | 18.0 | 17.0 | 16.0 | 16.0 |
| 28 | 3.0 | 3.0 | 6.0 | 5.5 | 13.0 | 12.0 | 16.0 | 15.5 | 17.0 | 17.0 | 16.0 | 15.5 |
| 29 | 3.5 | 3.0 | 6.0 | 5.5 | 13.0 | 12.0 | 16.5 | 15.5 | 17.0 | 17.0 | 15.5 | 15.0 |
| 30 | 3.5 | 3.0 | 6.5 | 6.0 | 13.0 | 13.0 | 16.5 | 16.0 | 17.0 | 17.0 | 15.0 | 14.5 |
| 31 | --- | --- | 7.0 | 6.5 | --- | --- | 16.5 | 16.0 | 17.0 | 17.0 | --- | --- |
| MONTH | 3.5 | 1.5 | 7.0 | 3.0 | 13.0 | 6.5 | 16.5 | 13.0 | 18.0 | 16.0 | 17.0 | 14.5 |
| YEAR | 18.0 | 1.0 | | | | | | | | | | |

06288200 BEAUVAIS CREEK NEAR ST. XAVIER, MONT.
(Hydrologic bench-mark station)

LOCATION.--Lat 45°28'40", long 108°00'33", on west line of sec.15, T.4 S., R.30 E., Big Horn County, at gaging station 1 mile downstream from Point Creek, 3 miles upstream from Muddy Creek, and 14 miles west of St. Xavier.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 07... | 1130 | 7.9 | -- | 16 | 0 | 240 | 48 | 33 | 3.6 | 196 | 0 | 650 |
| NOV. | | | | | | | | | | | | |
| 06... | 1115 | 8.6 | -- | 13 | 270 | 250 | 55 | 48 | 3.4 | 248 | 0 | 720 |
| DEC. | | | | | | | | | | | | |
| 21... | 1130 | 4.4 | -- | 10 | 0 | 270 | 60 | 71 | 3.3 | 319 | 0 | 810 |
| JAN. | | | | | | | | | | | | |
| 21... | 1200 | 44 | .0 | 6.7 | 360 | 47 | 12 | 85 | 7.4 | 92 | 0 | 250 |
| FEB. | | | | | | | | | | | | |
| 25... | 1300 | 16 | .0 | 14 | 110 | 240 | 53 | 69 | 3.8 | 283 | 0 | 640 |
| MAR. | | | | | | | | | | | | |
| 25... | 1030 | 22 | 2.0 | 12 | 20 | 200 | 48 | 80 | 3.3 | 199 | -- | 670 |
| MAY | | | | | | | | | | | | |
| 03... | 1345 | 50 | 19.5 | 13 | 40 | 140 | 35 | 13 | 3.1 | 242 | -- | 330 |
| JUNE | | | | | | | | | | | | |
| 02... | 1700 | 31 | 15.0 | 14 | 20 | 180 | 43 | 68 | 3.1 | 257 | 0 | 530 |
| JULY | | | | | | | | | | | | |
| 06... | 1430 | 9.9 | 17.0 | 16 | 10 | 200 | 44 | 28 | 2.9 | 155 | 0 | 610 |
| AUG. | | | | | | | | | | | | |
| 18... | 1100 | 5.0 | -- | 12 | 20 | 250 | 50 | 24 | 3.2 | 162 | 0 | 720 |
| SEP. | | | | | | | | | | | | |
| 13... | 1230 | 4.9 | 15.5 | 17 | 10 | 240 | 48 | 28 | 2.8 | 206 | 0 | 700 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED-PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) |
|---|---|---|---|---|---|---|
| OCT. | | | | | | |
| 07... | 1130 | 7.9 | .020 | -- | -- | 1190 |
| NOV. | | | | | | |
| 06... | 1115 | 8.6 | .010 | 1.4 | -- | 1260 |
| DEC. | | | | | | |
| 21... | 1130 | 4.4 | .060 | .8 | -- | 1470 |
| JAN. | | | | | | |
| 21... | 1200 | 44 | .28 | 7.7 | 100 | -- |
| FEB. | | | | | | |
| 25... | 1300 | 16 | .030 | .4 | 310 | -- |
| MAR. | | | | | | |
| 25... | 1030 | 22 | .090 | 1.1 | 110 | -- |
| MAY | | | | | | |
| 03... | 1345 | 50 | .060 | 2.8 | 70 | -- |
| JUNE | | | | | | |
| 02... | 1700 | 31 | .050 | 1.0 | 50 | -- |
| JULY | | | | | | |
| 06... | 1430 | 9.9 | .10 | .8 | 210 | -- |
| AUG. | | | | | | |
| 18... | 1100 | 5.0 | .15 | .7 | 10 | -- |
| SEP. | | | | | | |
| 13... | 1230 | 4.9 | .21 | 1.4 | 20 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 07... | 1130 | 7.9 | -- | 0 | 0 | 0 | 0 | 0 |
| MAY | | | | | | | | |
| 03... | 1345 | 50 | 500 | -- | 0 | 0 | -- | 0 |
| SEP. | | | | | | | | |
| 13... | 1230 | 4.9 | 100 | -- | 0 | -- | -- | 0 |

06288200 BEAUVAIS CREEK NEAR ST. XAVIER, MONT.--Continued

DRAINAGE AREA.--100 sq mi.

PERIOD OF RECORD.--Chemical analyses: September 1967 to September 1971.
Sediment records: February 1968 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 07... | 3.8 | .8 | -- | -- | 1090 | 1.62 | 25.4 | 780 | 620 | .5 | 1340 | 7.7 |
| NOV. | | | | | | | | | | | | |
| 06... | 4.6 | .4 | -- | -- | 1220 | 1.71 | 29.3 | 850 | 650 | .7 | 1460 | 8.1 |
| DEC. | | | | | | | | | | | | |
| 21... | 3.4 | .5 | -- | -- | 1390 | 2.00 | 17.5 | 930 | 670 | 1.0 | 1590 | 7.8 |
| JAN. | | | | | | | | | | | | |
| 21... | 5.5 | .4 | .20 | .80 | 460 | .63 | 54.6 | 170 | 95 | 2.9 | 705 | 7.7 |
| FEB. | | | | | | | | | | | | |
| 25... | 4.6 | .5 | .30 | .20 | 1160 | 1.58 | 50.1 | 810 | 580 | 1.1 | 1550 | 8.2 |
| MAR. | | | | | | | | | | | | |
| 25... | 3.5 | 1.0 | .20 | .09 | 1120 | 1.52 | 66.5 | 700 | 530 | 1.3 | 1390 | 8.1 |
| MAY | | | | | | | | | | | | |
| 03... | 2.7 | .0 | .10 | .15 | 659 | .90 | 89.0 | 490 | 300 | .3 | 1010 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 02... | 2.4 | .3 | .21 | .12 | 968 | 1.32 | 81.3 | 630 | 420 | 1.2 | 1300 | 7.9 |
| JULY | | | | | | | | | | | | |
| 06... | 2.9 | .2 | .07 | .25 | 981 | 1.33 | 26.2 | 680 | 550 | .5 | 1260 | 7.8 |
| AUG. | | | | | | | | | | | | |
| 18... | 2.4 | .2 | .00 | .46 | 1140 | 1.55 | 15.5 | 830 | 700 | .4 | 1370 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 13... | 2.0 | .4 | .13 | .09 | 1140 | 1.55 | 15.1 | 800 | 630 | .4 | 1450 | 8.0 |

| DATE | DISSOLVED COPPER (CU) (UG/L) | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED LITHIUM (LI) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 07... | -- | 0 | -- | -- | -- | -- | 24 |
| MAY | | | | | | | |
| 03... | 6 | 0 | 36 | 1 | 6 | 1600 | 10 |
| SEP. | | | | | | | |
| 13... | 3 | 3 | 30 | 6 | 8 | 3800 | 20 |

06288200 BEAUVAIS CREEK NEAR ST. XAVIER, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 07... | 1130 | 7.9 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SEP., 1971 13... | 1230 | 4.9 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN IN BOTTOM DE-POSITS (UG/KG) | LINDANE IN BOTTOM DE-POSITS (UG/KG) | CHLOR-DANE IN BOTTOM DE-POSITS (UG/KG) | DDD IN BOTTOM DE-POSITS (UG/KG) | DDE IN BOTTOM DE-POSITS (UG/KG) | DDT IN BOTTOM DE-POSITS (UG/KG) |
|---|---|---|---|---|---|---|---|---|
| OCT. 07... | 1130 | 7.9 | .00 | .00 | .00 | .20 | .40 | 1.0 |
| SEP., 1971 13... | 1230 | 4.9 | <.20 | <.20 | <1.0 | <.20 | <.20 | <.20 |

RADIOCHEMICAL ANALYSES

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED NATURAL URANIUM (U) (UG/L) | DIS-SOLVED RA-226 (RADON METHOD) (PC/L) | DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L) | DIS-SOLVED GROSS ALPHA AS U-NAT. (PC/L) | DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L) |
|---|---|---|---|---|---|---|---|---|
| OCT.. 1970 07... | 1130 | 7.9 | 6.5 | 4.4 | .10 | <13 | <4.4 | 4.5 |
| SEP.. 1971 13... | 1230 | 4.9 | 15.5 | 4.1 | .15 | 22 | 7.4 | 5.5 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | IMME-DIATE COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. 07... | 1130 | 6.5 | 1.5 | 1290 | 10.4 | 8.1 | 660000 |
| NOV. 06... | 1115 | 1.5 | 15.0 | 1220 | 11.8 | 7.9 | 1500000 |
| DEC. 21... | 1130 | .0 | -7.0 | 2200 | 12.2 | 7.8 | 13000 |
| JAN. 21... | 1200 | .0 | .0 | 950 | 11.4 | 7.1 | 400000 |
| FEB. 25... | 1300 | .0 | .5 | 1700 | 12.2 | 7.8 | 970000 |
| MAR. 25... | 1030 | 2.0 | 7.0 | 1580 | 12.2 | 8.1 | 250000 |
| MAY 03... | 1345 | 19.5 | 26.0 | 1220 | 9.8 | 8.3 | 130000 |
| JUNE 02... | 1700 | 15.0 | -- | 1300 | 9.4 | 8.1 | 910000 |
| JULY 06... | 1430 | 17.0 | 34.0 | 1640 | 9.4 | 7.9 | 1500 |
| AUG. 18... | 1100 | 19.5 | 31.0 | 1400 | 7.8 | 7.8 | 3300 |
| SEP. 13... | 1230 | 15.5 | 31.5 | 1700 | 8.6 | 8.0 | 38000 |

06288200 BEAUVAIS CREEK NEAR ST. XAVIER, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 07... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SEP., 1971 | | | | | | | | | |
| 13... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

| DATE | DI-ELDRIN IN BOTTOM DE-POSITS (UG/KG) | ENDRIN IN BOTTOM DE-POSITS (UG/KG) | HEPTA-CHLOR IN BOTTOM DE-POSITS (UG/KG) | HEPTA-CHLOR EPOXIDE IN BOT-TOM DE-POSITS (UG/KG) | MALA-THION IN BOTTOM DE-POSITS (UG/KG) | PARA-THION IN BOTTOM DE-POSITS (UG/KG) | DI-AZINON IN BOTTOM DE-POSITS (UG/KG) | METHYL PARA-THION IN BOT-TOM DE-POSITS (UG/KG) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 07... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SEP., 1971 | | | | | | | | |
| 13... | <.20 | <.20 | <.20 | <.20 | <.20 | <.20 | -- | <.20 |

RADIOCHEMICAL ANALYSES

| DATE | DIS-SOLVED GROSS BETA AS CS-137 (PC/L) | TOTAL FILT-RABLE RESIDUE (MG/L) | SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L) | SUS-PENDED GROSS ALPHA AS U-NAT. (PC/L) | SUS-PENDED GROSS ALPHA AS SR90 /Y90 (PC/L) | SUS-PENDED GROSS BETA AS CS-137 (PC/L) | TOTAL NON-FILT-RABLE RESIDUE (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT.. 1970 | | | | | | | |
| 07... | 5.1 | 1100 | 1.4 | .5 | 3.0 | 3.4 | 60 |
| SEP.. 1971 | | | | | | | |
| 13... | 6.3 | 1300 | 12 | 4.0 | 9.5 | 11 | 220 |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 07... | 1130 | 6.5 | 7.9 | 137 | 2.9 | -- | -- | -- |
| NOV. | | | | | | | | |
| 06... | 1115 | 1.5 | 8.6 | 285 | 6.6 | -- | -- | -- |
| DEC. | | | | | | | | |
| 21... | 1130 | .0 | 4.4 | 63 | .75 | -- | -- | -- |
| JAN. | | | | | | | | |
| 21... | 1200 | .0 | 44 | 769 | 91 | -- | -- | -- |
| FEB. | | | | | | | | |
| 25... | 1300 | .0 | 16 | 489 | 21 | -- | -- | -- |
| MAR. | | | | | | | | |
| 25... | 1030 | 2.0 | 22 | 765 | 45 | -- | -- | -- |
| APR. | | | | | | | | |
| 27... | 0800 | -- | 41 | 5580 | 618 | -- | -- | -- |
| MAY | | | | | | | | |
| 03... | 1345 | 19.5 | 50 | 321 | 43 | -- | -- | -- |
| JUNE | | | | | | | | |
| 02... | 1700 | 15.0 | 31 | 587 | 49 | 62 | 86 | 100 |
| JULY | | | | | | | | |
| 06... | 1430 | 17.0 | 9.9 | 104 | 2.8 | -- | -- | -- |
| AUG. | | | | | | | | |
| 18... | 1100 | 19.5 | 5.0 | 32 | .43 | -- | -- | -- |
| SEP. | | | | | | | | |
| 13... | 1400 | 15.5 | 4.9 | 317 | 4.2 | -- | -- | -- |

0.5 - 1,600
1967-70

## 06288500 BIGHORN RIVER NEAR HARDIN, MONT.

LOCATION.--Lat 45°43'46", long 107°34'52", in NE¼SE¼ sec.24, T.1 S., R.33 E., Big Horn County, at city water plant on left bank, 1 mile upstream from Little Bighorn River, 1.4 miles east of Hardin, and at mile 41.0.

DRAINAGE AREA.--20,722 sq mi (at former gaging station).

PERIOD OF RECORD.--Chemical analyses: January to September 1951, July 1969 to September 1971.
Water temperatures: December 1962 to September 1971.

EXTREMES.--1970-71:
Water temperatures: Maximum, 21.5°C Aug. 7; minimum, freezing point Jan. 30, 31, Feb. 6, 7, 27.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | NITRATE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 02... | 1400 | 1600 | 79 | 27 | 310 | 12 | .2 | -- |
| NOV. | | | | | | | | |
| 19... | 1100 | 2900 | 78 | 25 | 320 | 11 | .4 | -- |
| DEC. | | | | | | | | |
| 28... | 1130 | 4700 | 75 | 24 | 280 | 8.8 | .4 | -- |
| JAN. | | | | | | | | |
| 20... | 1100 | 3600 | 74 | 26 | 230 | 11 | -- | .10 |
| FEB. | | | | | | | | |
| 09... | 1600 | 3700 | 79 | 22 | 280 | 11 | -- | .40 |
| MAR. | | | | | | | | |
| 25... | 1330 | 5200 | 87 | 29 | 320 | 14 | -- | .30 |
| APR. | | | | | | | | |
| 28... | 1400 | 5700 | 77 | 27 | 320 | 14 | -- | .30 |
| MAY | | | | | | | | |
| 14... | 1100 | 7300 | 69 | 21 | 330 | 14 | -- | .40 |
| JUNE | | | | | | | | |
| 02... | 1300 | 8000 | 65 | 28 | 320 | 11 | -- | .34 |
| JULY | | | | | | | | |
| 14... | 1230 | 6600 | 42 | 19 | 260 | 7.0 | -- | .39 |
| AUG. | | | | | | | | |
| 11... | 1400 | 3300 | 32 | 15 | 150 | 4.8 | -- | .13 |
| SEP. | | | | | | | | |
| 14... | 1000 | 2400 | 47 | 15 | 160 | 6.2 | -- | .20 |

06288500 BIGHORN RIVER NEAR HARDIN, MONT.--Continued

EXTREMES.--Continued
Period of record:
Water temperatures: Maximum (1962-64, 1967-71), 26.0°C Aug. 10, 1963, July 21, 22, 1964; minimum, freezing point on many days during winter period most years.

REMARKS.--Temperature recorder at Two Leggins Canal diversion dam 9.5 miles upstream from sampling site. Records furnished by Montana Fish and Game Department. Records of discharge are estimated from records for station 06287000, Bighorn River near St. Xavier.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 02... | 659 | .90 | 2850 | 310 | .02 | .030 | 3.3 |
| NOV. | | | | | | | |
| 19... | 655 | .89 | 5130 | 300 | .05 | .010 | .9 |
| DEC. | | | | | | | |
| 28... | 562 | .76 | 7130 | 280 | .02 | .090 | 3.2 |
| JAN. | | | | | | | |
| 20... | 580 | .79 | 5640 | 290 | .02 | -- | 2.6 |
| FEB. | | | | | | | |
| 09... | 658 | .89 | 6570 | 290 | .00 | .030 | .7 |
| MAR. | | | | | | | |
| 25... | 689 | .94 | 9670 | 340 | .25 | .090 | .9 |
| APR. | | | | | | | |
| 28... | 690 | -- | -- | 300 | .10 | .50 | 1.2 |
| MAY | | | | | | | |
| 14... | 676 | -- | 13300 | 260 | .09 | .10 | 1.5 |
| JUNE | | | | | | | |
| 02... | 668 | .00 | 14400 | 280 | .14 | .20 | 1.2 |
| JULY | | | | | | | |
| 14... | 496 | .67 | 8840 | 180 | .08 | .10 | 2.4 |
| AUG. | | | | | | | |
| 11... | 362 | .49 | 3230 | 140 | .08 | .070 | 1.6 |
| SEP. | | | | | | | |
| 14... | 372 | .51 | 2410 | 180 | .29 | .080 | 1.8 |

YELLOWSTONE RIVER BASIN

06288500 BIGHORN RIVER NEAR HARDIN, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 02... | 1400 | 15.0 | 17.5 | 880 | 10.6 | 8.4 | 170 |
| NOV. | | | | | | | |
| 19... | 1100 | 7.5 | 6.5 | 990 | 11.4 | 8.1 | -- |
| DEC. | | | | | | | |
| 28... | 1130 | 2.5 | -2.5 | 1160 | 12.0 | 7.9 | -- |
| JAN. | | | | | | | |
| 20... | 1100 | 3.0 | 1.0 | 910 | 11.4 | 7.8 | 130 |
| FEB. | | | | | | | |
| 09... | 1600 | 1.5 | 6.5 | 950 | 11.4 | 8.2 | 0 |
| MAR. | | | | | | | |
| 25... | 1330 | 2.5 | 4.0 | 1000 | 11.2 | 7.8 | 0 |
| APR. | | | | | | | |
| 28... | 1400 | 6.0 | 16.0 | 1100 | 11.2 | 7.9 | 270 |
| MAY | | | | | | | |
| 14... | 1100 | 7.0 | 25.0 | 1000 | 11.2 | 7.1 | 7700 |
| JUNE | | | | | | | |
| 02... | 1300 | 10.5 | 23.0 | 1000 | 11.0 | 7.9 | 1200 |
| JULY | | | | | | | |
| 14... | 1230 | 17.0 | 29.0 | 730 | 9.8 | 8.1 | 93 |
| AUG. | | | | | | | |
| 11... | 1400 | 21.0 | 34.0 | 1000 | 9.2 | 8.3 | 100 |
| SEP. | | | | | | | |
| 14... | 1000 | 16.0 | 19.0 | 560 | 9.0 | 8.3 | 100 |

06288500 BIGHORN RIVER NEAR HARDIN, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 14.5 | 13.0 | 9.0 | 8.0 | 6.5 | 6.0 | 3.5 | 3.5 | 2.0 | 0.5 | 1.5 | 0.5 |
| 2 | 14.5 | 13.0 | 8.5 | 8.0 | 6.5 | 5.5 | 4.0 | 3.5 | 1.5 | 0.5 | 2.0 | 0.5 |
| 3 | 14.5 | 12.0 | 8.5 | 7.0 | 6.5 | 5.0 | 3.5 | 3.0 | 1.0 | 0.5 | 3.0 | 1.0 |
| 4 | 15.0 | 13.0 | 8.5 | 7.0 | 5.5 | 4.5 | 3.0 | 2.0 | 1.5 | 0.5 | 3.0 | 1.0 |
| 5 | 14.0 | 12.0 | 9.0 | 8.0 | 5.5 | 4.5 | 3.5 | 2.0 | 1.5 | 0.5 | 3.0 | 1.0 |
| 6 | 12.0 | 10.0 | 10.0 | 9.0 | 7.0 | 5.5 | 3.0 | 1.5 | 0.5 | 0.0 | 2.0 | 1.0 |
| 7 | 11.0 | 9.5 | 9.5 | 9.0 | 7.0 | 6.5 | 3.0 | 3.0 | 0.5 | 0.0 | 3.5 | 1.0 |
| 8 | 11.0 | 10.5 | 9.5 | 8.5 | 7.0 | 6.5 | 3.5 | 2.0 | 1.5 | 0.5 | 3.0 | 1.5 |
| 9 | 11.5 | 10.0 | 9.0 | 8.5 | 6.5 | 5.5 | 2.0 | 1.0 | 2.0 | 0.5 | 3.5 | 1.5 |
| 10 | 11.5 | 10.5 | 9.0 | 8.5 | 6.0 | 5.0 | 1.0 | 0.5 | 3.0 | 2.0 | 3.5 | 2.0 |
| 11 | 12.0 | 10.5 | 9.0 | 8.5 | 5.5 | 5.0 | 0.5 | 0.5 | 3.0 | 1.0 | 4.0 | 1.5 |
| 12 | 12.0 | 11.0 | 9.5 | 9.0 | 5.5 | 5.0 | 1.0 | 0.5 | 2.0 | 1.0 | 4.0 | 1.5 |
| 13 | 11.0 | 10.5 | 9.0 | 8.5 | 5.5 | 5.0 | 1.0 | 0.5 | 2.0 | 1.5 | 3.0 | 2.0 |
| 14 | 11.5 | 10.0 | 9.0 | 8.5 | 6.0 | 5.0 | 0.5 | 0.5 | 2.0 | 1.5 | 3.5 | 1.5 |
| 15 | 11.5 | 10.0 | 9.0 | 8.5 | 6.0 | 5.5 | 3.5 | 0.5 | 2.0 | 1.5 | 4.0 | 1.0 |
| 16 | 12.0 | 11.0 | 9.0 | 8.5 | 6.0 | 6.0 | 4.0 | 3.5 | 3.0 | 1.5 | 3.0 | 1.0 |
| 17 | 13.0 | 11.0 | 9.0 | 8.5 | 6.0 | 4.5 | 3.5 | 3.5 | 1.5 | 1.0 | 1.5 | 1.0 |
| 18 | 12.0 | 10.5 | 8.5 | 7.0 | 4.5 | 4.0 | 3.5 | 3.0 | 2.0 | 1.5 | 3.0 | 1.0 |
| 19 | 11.5 | 11.0 | 7.0 | 7.0 | 4.0 | 3.5 | 4.0 | 3.0 | 2.0 | 1.0 | 4.0 | 1.0 |
| 20 | 13.0 | 11.0 | 7.0 | 7.0 | 4.5 | 3.5 | 4.0 | 2.0 | 2.0 | 0.5 | 4.5 | 1.5 |
| 21 | 12.0 | 11.0 | 7.0 | 4.0 | 4.0 | 3.5 | 2.0 | 1.0 | 1.5 | 0.5 | 1.5 | 0.5 |
| 22 | 11.0 | 8.0 | 4.0 | 3.5 | 4.0 | 3.5 | 1.5 | 1.5 | 2.0 | 0.5 | 2.0 | 0.5 |
| 23 | 11.5 | 6.5 | 5.0 | 3.5 | 4.0 | 3.0 | 2.0 | 1.5 | 3.0 | 1.0 | 3.5 | 0.5 |
| 24 | 11.0 | 9.0 | 8.0 | 5.0 | 4.5 | 4.0 | 2.0 | 2.0 | 3.5 | 1.0 | 4.5 | 1.5 |
| 25 | 10.5 | 9.5 | 8.0 | 5.0 | 4.5 | 3.5 | 2.0 | 1.5 | 3.0 | 1.0 | 3.5 | 2.0 |
| 26 | 9.5 | 9.0 | 5.5 | 5.0 | 4.5 | 4.0 | 1.5 | 1.5 | 2.0 | 0.5 | 4.5 | 2.0 |
| 27 | 9.0 | 8.5 | 5.5 | 5.0 | 4.5 | 3.5 | 4.0 | 1.5 | 2.0 | 0.0 | 4.0 | 3.0 |
| 28 | 8.5 | 8.5 | 5.5 | 5.0 | 4.5 | 4.0 | 4.0 | 3.0 | 1.5 | 0.5 | 4.0 | 2.0 |
| 29 | 9.0 | 8.5 | 6.5 | 5.0 | 4.5 | 4.0 | 3.5 | 1.0 | --- | --- | 4.5 | 1.5 |
| 30 | 10.0 | 9.0 | 6.5 | 6.5 | 4.5 | 4.5 | 1.0 | 0.0 | --- | --- | 5.5 | 2.0 |
| 31 | 9.0 | 8.0 | --- | --- | 5.0 | 4.0 | 0.5 | 0.0 | --- | --- | 3.5 | 2.0 |
| MONTH | 15.0 | 6.5 | 10.0 | 3.5 | 7.0 | 3.0 | 4.0 | 0.0 | 3.5 | 0.0 | 5.5 | 0.5 |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 4.5 | 1.5 | 8.0 | 4.5 | 13.0 | 8.0 | 17.0 | 13.5 | 20.0 | 16.0 | 20.0 | 17.0 |
| 2 | 4.0 | 2.0 | 8.0 | 4.5 | 11.0 | 8.0 | 16.0 | 13.0 | 20.0 | 16.0 | 19.0 | 16.5 |
| 3 | 3.5 | 2.0 | 7.0 | 5.0 | 11.5 | 8.5 | 16.0 | 13.5 | 20.0 | 17.0 | 16.5 | 15.0 |
| 4 | 4.5 | 1.5 | 7.0 | 5.0 | 11.0 | 9.0 | 17.0 | 10.0 | 21.0 | 17.0 | 16.5 | 15.0 |
| 5 | 5.0 | 1.5 | 8.5 | 5.0 | 13.0 | 9.0 | 18.0 | 13.5 | 21.0 | 18.0 | 19.0 | 15.5 |
| 6 | 5.5 | 1.5 | 8.5 | 4.5 | 12.0 | 9.0 | 18.0 | 14.0 | 21.0 | 18.0 | 19.5 | 16.0 |
| 7 | 4.5 | 3.0 | 8.0 | 5.0 | 13.0 | 9.5 | 17.0 | 14.0 | 21.5 | 18.0 | 18.0 | 15.5 |
| 8 | 5.5 | 2.0 | 8.5 | 4.5 | 13.5 | 9.5 | 17.0 | 13.5 | 21.0 | 18.0 | 19.0 | 15.0 |
| 9 | 5.5 | 2.0 | 7.0 | 5.0 | 13.5 | 10.5 | 18.5 | 14.5 | 20.5 | 17.0 | 19.5 | 16.0 |
| 10 | 6.0 | 3.0 | 8.0 | 4.5 | 14.0 | 10.5 | 19.0 | 15.0 | 20.5 | 17.0 | 20.0 | 16.5 |
| 11 | 5.5 | 3.0 | 8.5 | 4.5 | 13.5 | 11.0 | 18.5 | 15.0 | 20.5 | 17.0 | 19.5 | 16.5 |
| 12 | 4.5 | 2.0 | 9.0 | 4.5 | 14.5 | 11.0 | 18.5 | 14.5 | 20.5 | 17.0 | 19.5 | 15.5 |
| 13 | 5.5 | 2.0 | 8.5 | 4.5 | 14.5 | 11.5 | 19.0 | 14.5 | 20.5 | 17.0 | 19.0 | 15.5 |
| 14 | 6.0 | 3.0 | 8.5 | 5.5 | 15.0 | 11.5 | 19.0 | 15.0 | 21.0 | 17.0 | 16.5 | 14.5 |
| 15 | 5.0 | 3.5 | 8.5 | 5.0 | 14.5 | 11.5 | 19.0 | 15.0 | 20.0 | 18.0 | 15.0 | 14.0 |
| 16 | 6.0 | 3.0 | 6.0 | 5.0 | 15.0 | 11.5 | 19.0 | 15.0 | 20.5 | 18.0 | 14.5 | 14.0 |
| 17 | 5.5 | 3.0 | 6.5 | 4.5 | 15.0 | 11.5 | 19.0 | 15.5 | 20.5 | 17.0 | 14.5 | 13.5 |
| 18 | 4.5 | 3.5 | 5.5 | 4.5 | 15.0 | 11.5 | 19.5 | 15.5 | 20.5 | 17.0 | 16.0 | 13.0 |
| 19 | 4.0 | 3.5 | 6.5 | 5.0 | 15.5 | 12.0 | 20.0 | 15.5 | 20.5 | 16.5 | 15.5 | 14.0 |
| 20 | 4.5 | 3.5 | 7.0 | 5.0 | 16.0 | 12.0 | 19.5 | 15.5 | 20.5 | 16.5 | 15.5 | 13.0 |
| 21 | 4.0 | 3.5 | 6.0 | 5.5 | 16.0 | 12.0 | 20.0 | 16.0 | 21.0 | 18.0 | 14.5 | 13.0 |
| 22 | 4.0 | 3.5 | 5.5 | 5.5 | 16.0 | 13.0 | 19.5 | 15.5 | 21.0 | 18.0 | 15.5 | 13.5 |
| 23 | 6.0 | 3.5 | 8.0 | 5.5 | 16.0 | 13.0 | 20.0 | 16.0 | 19.5 | 16.0 | 16.5 | 14.0 |
| 24 | 4.5 | 4.0 | 9.5 | 6.0 | 15.5 | 13.0 | 19.0 | 16.0 | 19.5 | 15.5 | 17.0 | 14.5 |
| 25 | 4.5 | 4.0 | 9.5 | 6.5 | 15.0 | 13.0 | 18.0 | 15.5 | 19.5 | 16.0 | 17.0 | 15.0 |
| 26 | 4.5 | 4.0 | 10.0 | 6.5 | 15.0 | 13.0 | 19.5 | 15.5 | 20.0 | 18.0 | 16.0 | 14.5 |
| 27 | 4.5 | 4.0 | 10.5 | 6.5 | 13.5 | 12.0 | 16.5 | 15.5 | 21.0 | 18.0 | 16.0 | 14.0 |
| 28 | 6.0 | 4.5 | 10.5 | 7.0 | 13.5 | 12.0 | 16.5 | 15.0 | 19.5 | 18.5 | 16.0 | 14.0 |
| 29 | 5.5 | 4.0 | 8.0 | 6.5 | 15.5 | 12.0 | 19.5 | 15.0 | 19.0 | 17.0 | 14.5 | 13.5 |
| 30 | 8.0 | 4.5 | 7.0 | 6.5 | 16.0 | 12.0 | 20.0 | 15.5 | 18.5 | 17.0 | 14.0 | 13.0 |
| 31 | --- | --- | 8.0 | 7.0 | --- | --- | 19.0 | 16.0 | 20.0 | 16.5 | --- | --- |
| MONTH | 8.0 | 1.5 | 10.5 | 4.5 | 16.0 | 8.0 | 20.0 | 10.0 | 21.5 | 15.5 | 20.0 | 13.0 |
| YEAR | 21.5 | 0.0 | | | | | | | | | | |

## 06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.

LOCATION.--Lat 45°10'38", long 107°23'36", in W½SW¼ sec.35, T.7 S., R.35 E., Big Horn County, at gaging station 3.5 miles north of Wyola and 6 miles downstream from Pass Creek.

DRAINAGE AREA.--428 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1969 to September 1971.
Water temperatures: October 1969 to September 1971.
Sediment records: October 1969 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 433 mg/l Apr. 1-30; minimum, 201 mg/l June 1-24.
Hardness: Maximum, 300 mg/l Apr. 1-30; minimum, 170 mg/l Feb. 11-15, June 1-24, June 25-30.
Specific conductance: Maximum daily, 792 micromhos Apr. 6; minimum daily, 323 micromhos June 10.
Water temperatures: Maximum, 22.5°C July 16; Aug. 8; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-10 | -- | 158 | -- | 7.5 | -- | 55 | 27 | 20 | 1.8 | 229 | 0 | 100 |
| 11-31 | -- | 155 | -- | 7.9 | -- | 59 | 28 | 22 | 1.8 | 233 | 0 | 110 |
| NOV. | | | | | | | | | | | | |
| 01-10 | -- | 150 | -- | 9.1 | -- | 49 | 28 | 22 | 1.8 | 210 | 0 | 110 |
| 11-30 | -- | 155 | -- | 8.1 | -- | 53 | 28 | 23 | 1.8 | 219 | 0 | 120 |
| DEC. | | | | | | | | | | | | |
| 01-31 | -- | 148 | -- | 7.4 | -- | 58 | 29 | 22 | 1.5 | 229 | 0 | 120 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 136 | -- | 8.0 | 140 | 67 | 27 | 21 | 2.2 | 171 | 60 | 100 |
| FEB. | | | | | | | | | | | | |
| 01-10 | -- | 139 | -- | 7.7 | 10 | 70 | 29 | 26 | 2.5 | 256 | 6 | 120 |
| 11-15 | -- | 370 | -- | 7.8 | 40 | 43 | 16 | 21 | 4.5 | 171 | -- | 85 |
| 16-28 | -- | 160 | -- | 8.0 | 10 | 60 | 29 | 40 | 2.8 | 200 | -- | 160 |
| MAR. | | | | | | | | | | | | |
| 01-31 | -- | 187 | -- | 8.8 | 10 | 63 | 28 | 41 | 3.1 | 234 | -- | 170 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 262 | -- | 9.2 | 20 | 69 | 30 | 33 | 2.6 | 238 | 0 | 170 |
| MAY | | | | | | | | | | | | |
| 01-08 | -- | 354 | -- | 8.0 | 10 | 64 | 27 | 20 | 1.3 | 256 | 0 | 100 |
| 09-26 | -- | 461 | -- | 7.0 | 10 | 46 | 20 | 13 | 1.2 | 204 | 0 | 66 |
| 27-31 | -- | 897 | -- | 6.6 | 20 | 46 | 15 | 8.2 | 1.1 | 186 | 0 | 39 |
| JUNE | | | | | | | | | | | | |
| 01-24 | -- | 814 | -- | 5.9 | 0 | 43 | 15 | 6.3 | 1.0 | 183 | 0 | 38 |
| 25-30 | -- | 436 | -- | 6.5 | 0 | 37 | 18 | 9.4 | 1.1 | 170 | 0 | 53 |
| JULY | | | | | | | | | | | | |
| 01-09 | -- | 305 | -- | 6.8 | 10 | 51 | 21 | 12 | 1.3 | 228 | 0 | 68 |
| 10-31 | -- | 174 | -- | 7.5 | 10 | 59 | 25 | 17 | 1.6 | 252 | 0 | 94 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 127 | -- | 8.1 | 10 | 63 | 27 | 19 | 1.4 | 252 | 0 | 110 |
| SEP. | | | | | | | | | | | | |
| 01-30 | -- | 130 | -- | 7.6 | 0 | 58 | 29 | 25 | 1.3 | 236 | 0 | 120 |
| WTD. AVG. | -- | -- | -- | 7.4 | -- | 54 | 23 | 19 | 1.7 | 212 | 3 | 93 |
| TIME WTD. AVG. | -- | 245 | -- | 7.8 | -- | 58 | 26 | 23 | 1.9 | 222 | 6 | 112 |
| TONS PER DAY | -- | -- | -- | 4.9 | -- | 36 | 15 | 12 | 1.1 | 140 | 2 | 62 |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| DEC. | | | | | | | | | | | | |
| 02... | 1600 | 153 | -- | 6.9 | 40 | 70 | 28 | 23 | 1.5 | 270 | 0 | 110 |
| MAR., 1971 | | | | | | | | | | | | |
| 03... | 1800 | 136 | .0 | 7.2 | 50 | 73 | 29 | 26 | 1.6 | 269 | 0 | 130 |
| JUNE | | | | | | | | | | | | |
| 02... | 1345 | 850 | 11.0 | 6.0 | 30 | 51 | 17 | 7.8 | .7 | 204 | 0 | 46 |
| SEP. | | | | | | | | | | | | |
| 01... | 1415 | 115 | 19.0 | 8.9 | 30 | 70 | 31 | 27 | 2.2 | 288 | 0 | 120 |

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment concentrations: Maximum daily, 3,510 mg/l Apr. 25; minimum daily, 17 mg/l Oct. 30, Nov. 3.
Sediment discharge: Maximum daily, 9,110 tons Apr. 25; minimum daily, 6.8 tons Nov. 3.

Period of record:
Dissolved solids: Maximum, 473 mg/l Mar. 20-31, 1970; minimum, 201 mg/l June 1-24, 1971.
Hardness: Maximum, 303 mg/l Apr. 13-26, Apr. 27 to May 3, 1970; minimum, 170 mg/l Feb. 11-15, June 1-24, June 25-30, 1971.
Specific conductance: Maximum daily, 792 micromhos Apr. 6, 1971; minimum daily, 323 micromhos June 10, 1971.
Water temperatures: Maximum, 22.5°C Aug. 7, 1970, July 16, Aug. 8, 1971; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 3,510 mg/l Apr. 25, 1971; minimum daily, 17 mg/l Oct. 30, Nov. 3, 1970.
Sediment discharge: Maximum daily, 9,110 tons Apr. 25, 1971; minimum daily, 6.5 tons Jan. 16, 1970.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Flow affected by ice Nov. 22-24, Dec. 11-16, Dec. 19 to Mar. 4.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-10 | 1.4 | .2 | -- | -- | 331 | .45 | 142 | 250 | 61 | .6 | 538 | 7.9 |
| 11-31 | 1.2 | .2 | -- | -- | 348 | .48 | 147 | 260 | 72 | .6 | 552 | 8.1 |
| NOV. | | | | | | | | | | | | |
| 01-10 | 1.2 | .2 | -- | -- | 322 | .46 | 136 | 240 | 64 | .6 | 517 | 8.2 |
| 11-30 | 1.2 | .3 | -- | -- | 340 | .46 | 141 | 250 | 69 | .6 | 540 | 8.3 |
| DEC. | | | | | | | | | | | | |
| 01-31 | 1.4 | .1 | -- | -- | 352 | .47 | 139 | 270 | 77 | .6 | 580 | 8.1 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 1.5 | .3 | .10 | .04 | 370 | .50 | 136 | 280 | 40 | .5 | 561 | 8.4 |
| FEB. | | | | | | | | | | | | |
| 01-10 | 1.4 | .5 | .00 | .00 | 395 | .54 | 148 | 290 | 74 | .7 | 612 | 8.5 |
| 11-15 | 1.6 | .4 | .50 | .31 | 266 | .36 | 266 | 170 | 33 | .7 | 413 | 8.3 |
| 16-28 | 1.5 | .5 | .10 | .00 | 401 | .55 | 173 | 270 | 110 | 1.1 | 629 | 8.3 |
| MAR. | | | | | | | | | | | | |
| 01-31 | 2.1 | .1 | .20 | .06 | 432 | .59 | 218 | 270 | 81 | 1.1 | 688 | 8.1 |
| APR. | | | | | | | | | | | | |
| 01-30 | 1.6 | .2 | .14 | .09 | 433 | .59 | 306 | 300 | 100 | .8 | 705 | 8.0 |
| MAY | | | | | | | | | | | | |
| 01-08 | 1.3 | .4 | .02 | .00 | 348 | .47 | 333 | 270 | 61 | .5 | 570 | 8.0 |
| 09-26 | 1.2 | .1 | .02 | .00 | 255 | .35 | 317 | 200 | 30 | .4 | 463 | 8.2 |
| 27-31 | 1.0 | .1 | .00 | .03 | 209 | .28 | 506 | 180 | 24 | .3 | 365 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 01-24 | 1.1 | .4 | .00 | .00 | 201 | .27 | 442 | 170 | 19 | .2 | 338 | 8.3 |
| 25-30 | 1.1 | .4 | .01 | .00 | 210 | .29 | 247 | 170 | 27 | .3 | 350 | 8.3 |
| JULY | | | | | | | | | | | | |
| 01-09 | .7 | .4 | .01 | .00 | 273 | .37 | 225 | 210 | 27 | .4 | 451 | 8.2 |
| 10-31 | .7 | .4 | .01 | .00 | 329 | .45 | 155 | 250 | 44 | .5 | 536 | 8.2 |
| AUG. | | | | | | | | | | | | |
| 01-31 | .9 | .0 | .00 | .03 | 353 | .48 | 121 | 270 | 62 | .5 | 572 | 8.2 |
| SEP. | | | | | | | | | | | | |
| 01-30 | 1.7 | .3 | .03 | .03 | 359 | .49 | 126 | 260 | 71 | .7 | 580 | 8.1 |
| WTD. AVG. | 1.3 | .3 | -- | -- | 307 | .42 | -- | 231 | 51 | .5 | 503 | 8.2 |
| TIME WTD. AVG. | 1.3 | .2 | -- | -- | 345 | .47 | -- | 253 | 62 | .6 | 556 | 8.2 |
| TONS PER DAY | .8 | .2 | -- | -- | 203 | -- | -- | -- | -- | -- | -- | -- |
| ANALYSES OF ADDITIONAL SAMPLES | | | | | | | | | | | | |
| DEC. | | | | | | | | | | | | |
| 02... | 1.2 | .2 | -- | -- | 377 | .54 | 164 | 290 | 66 | .6 | 602 | 8.3 |
| MAR., 1971 | | | | | | | | | | | | |
| 03... | 1.9 | .3 | .10 | .00 | 400 | .54 | 147 | 300 | 79 | .7 | 672 | 8.4 |
| JUNE | | | | | | | | | | | | |
| 02... | .8 | .2 | .19 | .03 | 231 | .31 | 530 | 200 | 30 | .2 | 389 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01... | 1.7 | .7 | .10 | .03 | 404 | .55 | 125 | 300 | 66 | .7 | 649 | 8.1 |

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 07... | 1700 | 157 | .010 | -- | -- |
| NOV. | | | | | |
| 05... | 1515 | 145 | .000 | -- | -- |
| DEC. | | | | | |
| 02... | 1600 | 153 | .000 | 70 | -- |
| JAN., 1971 | | | | | |
| 08... | 1350 | 142 | .000 | -- | -- |
| FEB. | | | | | |
| 03... | 1700 | 140 | .000 | -- | -- |
| MAR. | | | | | |
| 03... | 1800 | 136 | .030 | 40 | 70 |
| APR. | | | | | |
| 06... | 1910 | 170 | .050 | -- | -- |
| MAY | | | | | |
| 04... | 1920 | 344 | .060 | -- | -- |
| JUNE | | | | | |
| 02... | 1345 | 850 | .030 | 10 | 0 |
| JULY | | | | | |
| 07... | 1630 | 284 | .020 | -- | -- |
| AUG. | | | | | |
| 05... | 1245 | 155 | .020 | -- | -- |
| SEP. | | | | | |
| 01... | 1415 | 115 | .070 | 130 | 10 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 576 | 600 | 652 | 554 | 574 | 698 | 727 | 731 | 392 | 444 | 579 | 623 |
| 2 | 561 | 510 | 591 | 618 | 638 | 731 | 760 | 687 | 387 | 444 | 576 | 628 |
| 3 | 567 | 567 | 556 | 606 | 631 | 664 | 781 | 642 | 373 | 459 | 536 | 647 |
| 4 | 565 | 569 | 540 | 603 | 666 | 658 | 787 | 606 | 359 | 466 | 559 | 672 |
| 5 | 557 | 568 | 600 | 639 | 639 | 636 | 789 | 568 | 356 | 461 | 557 | 628 |
| 6 | 576 | 602 | 624 | 655 | 667 | 653 | 792 | 533 | 350 | 475 | 557 | 628 |
| 7 | 568 | 588 | 626 | 644 | 736 | 674 | 760 | 516 | 352 | 466 | 562 | 628 |
| 8 | 588 | 588 | 587 | 575 | 680 | 664 | 735 | 508 | 350 | 485 | 586 | 640 |
| 9 | 568 | 569 | 609 | 554 | 666 | 666 | 729 | 488 | 330 | 482 | 567 | 610 |
| 10 | 588 | 577 | 583 | 594 | 635 | 680 | 727 | 494 | 323 | 500 | 546 | 589 |
| 11 | 610 | 626 | 573 | 600 | 401 | 650 | 704 | 498 | 346 | 500 | 539 | 600 |
| 12 | 594 | 617 | 598 | 630 | 469 | 613 | 704 | 490 | 342 | 502 | 557 | 608 |
| 13 | 650 | 608 | 541 | 649 | 471 | 609 | 709 | 459 | 342 | 510 | 557 | 596 |
| 14 | 622 | 628 | 600 | 677 | 369 | 650 | 679 | 431 | 334 | 511 | 558 | 598 |
| 15 | 618 | 613 | 559 | 658 | 436 | 689 | 679 | 415 | 334 | 526 | 558 | 589 |
| 16 | 600 | 602 | 598 | 564 | 547 | 711 | 646 | 414 | 345 | 522 | 566 | 593 |
| 17 | 599 | 602 | 601 | 552 | 631 | 733 | 660 | 421 | 349 | 531 | 569 | 597 |
| 18 | 601 | 580 | 580 | 552 | 680 | 715 | 661 | 445 | 346 | 540 | 579 | 607 |
| 19 | 600 | 601 | 544 | 583 | 687 | 711 | 660 | 473 | 349 | 542 | 583 | 622 |
| 20 | 602 | 578 | 675 | 484 | 697 | 736 | 661 | 483 | 363 | 542 | 578 | 597 |
| 21 | 590 | 588 | 625 | 485 | 697 | 747 | 679 | 486 | 363 | 542 | 583 | 597 |
| 22 | 598 | 588 | 612 | 593 | 700 | 696 | 729 | 613 | 375 | 542 | 588 | 587 |
| 23 | 588 | 669 | 664 | 606 | 703 | 723 | 695 | 557 | 377 | 543 | 502 | 593 |
| 24 | 599 | 614 | 610 | 607 | 700 | 733 | 713 | 536 | 382 | 563 | 576 | 587 |
| 25 | 591 | 642 | 613 | 636 | 692 | 729 | 632 | 498 | 397 | 563 | 589 | 597 |
| 26 | 618 | 602 | 613 | 629 | 654 | 689 | 697 | 452 | 400 | 565 | 580 | 589 |
| 27 | 606 | 604 | 609 | 608 | 692 | 622 | 733 | 393 | 414 | 567 | 599 | 576 |
| 28 | 612 | 603 | 600 | 618 | 736 | 664 | 746 | 362 | 426 | 578 | 613 | 574 |
| 29 | 612 | 603 | 590 | 544 | --- | 715 | 731 | 346 | 429 | 578 | 618 | 582 |
| 30 | 599 | 616 | 601 | 406 | --- | 733 | 716 | 346 | 432 | 571 | 625 | 597 |
| 31 | 602 | --- | 599 | 534 | --- | 711 | --- | 398 | --- | 565 | 637 | --- |
| MONTH | 594 | 597 | 599 | 589 | 625 | 687 | 714 | 493 | 367 | 519 | 574 | 606 |
| YEAR | 580 | | | | | | | | | | | |

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.0 | 4.0 | 4.0 | 0.0 | 0.0 | 0.0 | 4.0 | 11.0 | 9.5 | 13.0 | 16.0 | 19.5 |
| 2 | 11.0 | 3.0 | 2.5 | 0.0 | 0.0 | 0.0 | 5.5 | 11.0 | 13.0 | 16.0 | 19.5 | 17.0 |
| 3 | 9.5 | 3.0 | 1.5 | 0.0 | 0.0 | 1.5 | 4.0 | 13.5 | 12.0 | 12.5 | 19.5 | 14.5 |
| 4 | 10.5 | 3.5 | 2.5 | 0.0 | 0.0 | 0.5 | 3.0 | 12.0 | 12.0 | 13.0 | 21.0 | 11.5 |
| 5 | 12.5 | 2.5 | 0.0 | 0.0 | 0.0 | 2.0 | 6.5 | 12.0 | 10.0 | 17.0 | 19.5 | 16.0 |
| 6 | 9.5 | 6.5 | 1.0 | 0.0 | 0.0 | 0.5 | 7.5 | 10.5 | 10.0 | 14.0 | 22.0 | 17.0 |
| 7 | 6.0 | 5.0 | 3.5 | 0.0 | 0.0 | 0.0 | 8.0 | 11.0 | 11.5 | 16.0 | 19.5 | 14.5 |
| 8 | 6.0 | 5.0 | 3.5 | 0.5 | 0.0 | 4.5 | 7.5 | 10.5 | 10.5 | 13.5 | 22.5 | 15.5 |
| 9 | 6.0 | 6.0 | 0.0 | 0.0 | 0.0 | 2.5 | 11.0 | 12.5 | 14.0 | 20.5 | 20.5 | 14.0 |
| 10 | 6.0 | 5.5 | 2.5 | 0.0 | 0.0 | 5.5 | 11.0 | 10.5 | 12.5 | 17.5 | 19.0 | 18.0 |
| 11 | 5.0 | 4.0 | 0.0 | 0.0 | 0.0 | 4.5 | 7.0 | 9.5 | 13.0 | 16.5 | 21.5 | 16.0 |
| 12 | 7.0 | 5.0 | 0.0 | 0.0 | 0.0 | 5.0 | 8.0 | 12.0 | 12.0 | 18.0 | 20.0 | 18.0 |
| 13 | 6.0 | 4.0 | 0.0 | 0.5 | 2.0 | 2.5 | 5.5 | 12.5 | 14.5 | 15.5 | 22.0 | 16.5 |
| 14 | 6.5 | 3.5 | 0.5 | 0.0 | 2.0 | 1.0 | 9.5 | 14.5 | 14.5 | 18.0 | 18.0 | 12.5 |
| 15 | 4.5 | 3.0 | 0.0 | 1.0 | 1.5 | 4.0 | 12.0 | 10.0 | 13.0 | 16.5 | 18.0 | 11.0 |
| 16 | 7.0 | 5.0 | 0.5 | 0.5 | 1.5 | 3.0 | 11.5 | 9.0 | 13.0 | 22.5 | 21.5 | 9.0 |
| 17 | 6.0 | 5.0 | 1.0 | 0.5 | 2.0 | 2.0 | 9.5 | 9.5 | 16.5 | 18.0 | 19.5 | 9.0 |
| 18 | 7.0 | 5.0 | 0.0 | 0.5 | 1.0 | 2.0 | 7.5 | 7.0 | 15.5 | 17.5 | 22.0 | 7.0 |
| 19 | 7.0 | 3.5 | 0.0 | 0.5 | 2.0 | 4.0 | 6.5 | 8.5 | 14.5 | 19.0 | 17.5 | 9.0 |
| 20 | 5.5 | 4.0 | 0.0 | 0.5 | 2.0 | 5.0 | 6.0 | 8.0 | 16.0 | 19.0 | 21.5 | 9.5 |
| 21 | 8.0 | 0.0 | 0.0 | 0.0 | 0.5 | 1.5 | 6.5 | 9.5 | 17.5 | 20.0 | 17.5 | 8.0 |
| 22 | 5.5 | 0.0 | 0.0 | 0.5 | 1.5 | 1.0 | 7.0 | 8.5 | 15.0 | 20.0 | 17.5 | 9.5 |
| 23 | 6.0 | 0.0 | 0.0 | 0.5 | 1.0 | 2.0 | 9.5 | 8.0 | 20.0 | 20.0 | 19.0 | 9.5 |
| 24 | 6.5 | 1.0 | 0.0 | 0.5 | 4.0 | 6.0 | 9.0 | 14.5 | 16.0 | 19.0 | 15.5 | 12.5 |
| 25 | 6.0 | 3.0 | 0.0 | 0.5 | 2.0 | 5.0 | 6.0 | 12.5 | 16.5 | 17.0 | 19.0 | 11.5 |
| 26 | 5.0 | 1.0 | 0.0 | 0.0 | 1.0 | 6.5 | 6.0 | 14.0 | 14.5 | 17.5 | 19.5 | 11.0 |
| 27 | 2.5 | 1.5 | 0.0 | 1.0 | 0.0 | 5.5 | 5.0 | 12.5 | 13.5 | 16.0 | 22.0 | 11.5 |
| 28 | 3.0 | 0.5 | 1.0 | 0.5 | 1.0 | 3.0 | 8.5 | 13.5 | 12.0 | 12.5 | 19.5 | 10.5 |
| 29 | 4.0 | 1.5 | 0.5 | 0.5 | --- | 7.5 | 9.0 | 9.5 | 12.5 | 13.5 | 18.0 | 10.5 |
| 30 | 5.5 | 3.5 | 0.5 | 0.0 | --- | 8.0 | 11.5 | 8.5 | 15.0 | 17.0 | 18.5 | 8.5 |
| 31 | 4.0 | --- | 1.0 | 0.0 | --- | 4.5 | --- | 8.5 | --- | 16.5 | 17.0 | --- |
| MONTH | 6.5 | 3.5 | 1.0 | 0.5 | 1.0 | 3.0 | 7.5 | 11.0 | 13.5 | 17.0 | 19.5 | 12.5 |
| YEAR | 8.0 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB. | | | | | | | | | | | |
| 12... | 1335 | .0 | 400 | 1700 | 1840 | 74 | 97 | 100 | -- | -- | -- |
| MAR. | | | | | | | | | | | |
| 13... | 1045 | 2.5 | 278 | 430 | 323 | 79 | 95 | 100 | -- | -- | -- |
| 25... | 1140 | 5.0 | 220 | 657 | 390 | 81 | 97 | 100 | -- | -- | -- |
| APR. | | | | | | | | | | | |
| 22... | 1100 | 7.0 | 362 | 1280 | 1250 | 67 | 86 | 98 | 100 | -- | -- |
| 25... | 1025 | 6.0 | 1170 | 5130 | 16200 | 64 | 82 | 96 | 99 | 100 | -- |
| JUNE | | | | | | | | | | | |
| 02... | 1350 | 11.0 | 850 | 229 | 526 | 31 | 46 | 86 | 95 | 99 | 100 |

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 162 | 33 | 14 | 153 | 22 | 9.1 | 170 | 207 | 95 |
| 2 | 162 | 28 | 12 | 150 | 19 | 7.7 | 153 | 81 | 33 |
| 3 | 165 | 29 | 13 | 148 | 17 | 6.8 | 153 | 58 | 24 |
| 4 | 157 | 30 | 13 | 145 | 19 | 7.4 | 148 | 42 | 17 |
| 5 | 150 | 29 | 12 | 145 | 27 | 11 | 141 | 31 | 12 |
| 6 | 155 | 28 | 12 | 150 | 26 | 11 | 143 | 36 | 14 |
| 7 | 155 | 21 | 8.8 | 148 | 35 | 14 | 148 | 35 | 14 |
| 8 | 155 | 30 | 13 | 153 | 40 | 17 | 148 | 37 | 15 |
| 9 | 153 | 37 | 15 | 148 | 26 | 10 | 145 | 32 | 13 |
| 10 | 170 | 52 | 24 | 162 | 58 | 25 | 139 | 30 | 11 |
| 11 | 162 | 75 | 33 | 160 | 107 | 46 | 145 | 26 | 10 |
| 12 | 170 | 54 | 25 | 155 | 86 | 36 | 150 | 34 | 14 |
| 13 | 175 | 189 | 89 | 165 | 92 | 41 | 155 | 35 | 15 |
| 14 | 162 | 98 | 43 | 160 | 122 | 53 | 160 | 42 | 18 |
| 15 | 150 | 71 | 29 | 153 | 75 | 31 | 160 | 39 | 17 |
| 16 | 157 | 69 | 29 | 153 | 50 | 21 | 150 | 75 | 30 |
| 17 | 155 | 50 | 21 | 150 | 42 | 17 | 139 | 57 | 21 |
| 18 | 153 | 37 | 15 | 153 | 39 | 16 | 143 | 55 | 21 |
| 19 | 153 | 36 | 15 | 153 | 35 | 14 | 130 | 37 | 13 |
| 20 | 155 | 35 | 15 | 155 | 33 | 14 | 125 | 61 | 21 |
| 21 | 155 | 37 | 15 | 155 | 33 | 14 | 130 | 41 | 14 |
| 22 | 153 | 36 | 15 | 130 | 30 | 11 | 135 | 35 | 13 |
| 23 | 153 | 27 | 11 | 100 | 53 | 14 | 135 | 37 | 13 |
| 24 | 153 | 33 | 14 | 185 | 155 | 77 | 140 | 45 | 17 |
| 25 | 155 | 24 | 10 | 177 | 142 | 68 | 150 | 37 | 15 |
| 26 | 148 | 22 | 8.8 | 160 | 52 | 22 | 150 | 27 | 11 |
| 27 | 143 | 34 | 13 | 157 | 47 | 20 | 155 | 29 | 12 |
| 28 | 145 | 18 | 7.0 | 153 | 44 | 18 | 155 | 45 | 19 |
| 29 | 148 | 20 | 8.0 | 155 | 59 | 25 | 160 | 63 | 27 |
| 30 | 150 | 17 | 6.9 | 165 | 116 | 52 | 160 | 39 | 17 |
| 31 | 153 | 25 | 10 | -- | -- | -- | 160 | 43 | 19 |
| TOTAL | 4832 | -- | 569.5 | 4596 | -- | 729.0 | 4575 | -- | 605 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 150 | 35 | 14 | 135 | 140 | 51 | 130 | 106 | 37 |
| 2 | 140 | 30 | 11 | 140 | 91 | 34 | 135 | 40 | 15 |
| 3 | 130 | 32 | 11 | 140 | 100 | 38 | 135 | 82 | 30 |
| 4 | 125 | 40 | 14 | 140 | 70 | 26 | 135 | 146 | 53 |
| 5 | 120 | 41 | 13 | 140 | 95 | 36 | 141 | 60 | 23 |
| 6 | 125 | 46 | 16 | 125 | 73 | 25 | 139 | 48 | 18 |
| 7 | 135 | 46 | 17 | 120 | 60 | 19 | 139 | 35 | 13 |
| 8 | 140 | 48 | 18 | 140 | 60 | 23 | 134 | 46 | 17 |
| 9 | 135 | 45 | 16 | 150 | 68 | 28 | 143 | 100 | 39 |
| 10 | 130 | 36 | 13 | 160 | 74 | 32 | 180 | 137 | 71 |
| 11 | 125 | 42 | 14 | 200 | 1750 | 945 | 255 | 271 | 187 |
| 12 | 120 | 42 | 14 | 400 | 2010 | 2170 | 267 | 217 | 156 |
| 13 | 115 | 39 | 12 | 500 | 1190 | 1610 | 278 | 366 | 275 |
| 14 | 110 | 41 | 12 | 400 | 760 | 821 | 228 | 168 | 103 |
| 15 | 125 | 44 | 15 | 350 | 320 | 302 | 190 | 102 | 52 |
| 16 | 140 | 60 | 23 | 250 | 166 | 112 | 177 | 102 | 49 |
| 17 | 145 | 67 | 26 | 225 | 90 | 55 | 165 | 97 | 43 |
| 18 | 150 | 48 | 19 | 175 | 57 | 27 | 150 | 92 | 37 |
| 19 | 150 | 48 | 19 | 160 | 70 | 30 | 148 | 85 | 34 |
| 20 | 150 | 371 | 150 | 145 | 75 | 29 | 167 | 179 | 81 |
| 21 | 145 | 152 | 60 | 135 | 85 | 31 | 201 | 382 | 212 |
| 22 | 140 | 41 | 15 | 130 | 78 | 27 | 155 | 125 | 52 |
| 23 | 145 | 35 | 14 | 140 | 62 | 23 | 155 | 122 | 51 |
| 24 | 145 | 59 | 23 | 145 | 74 | 29 | 162 | 145 | 63 |
| 25 | 145 | 95 | 37 | 150 | 84 | 34 | 234 | 690 | 436 |
| 26 | 145 | 100 | 39 | 145 | 76 | 30 | 247 | 555 | 370 |
| 27 | 145 | 136 | 53 | 140 | 77 | 29 | 311 | 1030 | 865 |
| 28 | 145 | 232 | 91 | 135 | 90 | 33 | 244 | 515 | 339 |
| 29 | 140 | 439 | 166 | -- | -- | -- | 207 | 335 | 187 |
| 30 | 140 | 212 | 80 | -- | -- | -- | 215 | 470 | 273 |
| 31 | 135 | 125 | 46 | -- | -- | -- | 242 | 435 | 284 |
| TOTAL | 4230 | -- | 1071 | 5315 | -- | 6649 | 5809 | -- | 4465 |

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 201 | 315 | 171 | 284 | 212 | 163 | 870 | 273 | 641 |
| 2 | 193 | 318 | 166 | 284 | 195 | 150 | 835 | 232 | 523 |
| 3 | 190 | 250 | 128 | 305 | 185 | 152 | 885 | 229 | 547 |
| 4 | 180 | 240 | 117 | 338 | 216 | 197 | 945 | 253 | 646 |
| 5 | 175 | 225 | 106 | 368 | 221 | 220 | 915 | 223 | 551 |
| 6 | 172 | 235 | 109 | 413 | 336 | 375 | 935 | 227 | 573 |
| 7 | 188 | 354 | 180 | 419 | 262 | 296 | 885 | 182 | 435 |
| 8 | 215 | 411 | 239 | 422 | 254 | 289 | 860 | 193 | 448 |
| 9 | 193 | 264 | 138 | 452 | 275 | 336 | 970 | 286 | 749 |
| 10 | 190 | 251 | 129 | 437 | 192 | 227 | 990 | 293 | 783 |
| 11 | 198 | 279 | 149 | 410 | 160 | 177 | 1010 | 290 | 791 |
| 12 | 185 | 267 | 133 | 425 | 169 | 194 | 915 | 217 | 536 |
| 13 | 175 | 113 | 53 | 476 | 301 | 387 | 885 | 203 | 485 |
| 14 | 172 | 86 | 40 | 562 | 343 | 520 | 875 | 182 | 430 |
| 15 | 177 | 76 | 36 | 587 | 329 | 521 | 830 | 162 | 363 |
| 16 | 183 | 70 | 35 | 602 | 280 | 455 | 782 | 129 | 272 |
| 17 | 177 | 84 | 40 | 576 | 183 | 285 | 778 | 118 | 248 |
| 18 | 183 | 76 | 38 | 510 | 142 | 196 | 755 | 123 | 251 |
| 19 | 183 | 58 | 29 | 446 | 115 | 138 | 702 | 104 | 197 |
| 20 | 188 | 61 | 31 | 404 | 106 | 116 | 650 | 97 | 170 |
| 21 | 198 | 125 | 67 | 380 | 92 | 94 | 626 | 93 | 157 |
| 22 | 329 | 1390 | 1290 | 443 | 479 | 573 | 569 | 84 | 129 |
| 23 | 281 | 900 | 683 | 413 | 250 | 279 | 548 | 83 | 123 |
| 24 | 255 | 600 | 413 | 374 | 133 | 134 | 520 | 72 | 101 |
| 25 | 905 | 3510 | 9110 | 380 | 132 | 135 | 485 | 57 | 75 |
| 26 | 666 | 1630 | 2930 | 422 | 135 | 154 | 458 | 56 | 69 |
| 27 | 482 | 840 | 1090 | 545 | 312 | 459 | 443 | 53 | 63 |
| 28 | 383 | 490 | 507 | 733 | 530 | 1050 | 437 | 52 | 61 |
| 29 | 326 | 310 | 273 | 1060 | 928 | 2660 | 413 | 51 | 57 |
| 30 | 302 | 250 | 204 | 1150 | 620 | 1930 | 377 | 52 | 53 |
| 31 | -- | -- | -- | 995 | 391 | 1050 | -- | -- | -- |
| TOTAL | 7845 | -- | 18634 | 15615 | -- | 13912 | 22148 | -- | 10527 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 350 | 71 | 67 | 141 | 64 | 24 | 115 | 57 | 18 |
| 2 | 332 | 78 | 70 | 143 | 58 | 22 | 108 | 63 | 18 |
| 3 | 341 | 79 | 73 | 148 | 61 | 24 | 113 | 69 | 21 |
| 4 | 332 | 72 | 65 | 153 | 63 | 26 | 150 | 195 | 79 |
| 5 | 311 | 57 | 48 | 150 | 66 | 27 | 136 | 102 | 37 |
| 6 | 299 | 66 | 53 | 145 | 61 | 24 | 121 | 61 | 20 |
| 7 | 275 | 63 | 47 | 139 | 61 | 23 | 134 | 55 | 20 |
| 8 | 253 | 68 | 46 | 136 | 54 | 20 | 143 | 151 | 58 |
| 9 | 253 | 52 | 36 | 143 | 60 | 23 | 132 | 114 | 41 |
| 10 | 242 | 60 | 39 | 141 | 55 | 21 | 125 | 66 | 22 |
| 11 | 231 | 68 | 42 | 141 | 52 | 20 | 119 | 65 | 21 |
| 12 | 225 | 54 | 33 | 139 | 51 | 19 | 115 | 49 | 15 |
| 13 | 212 | 51 | 29 | 130 | 47 | 16 | 117 | 47 | 15 |
| 14 | 198 | 45 | 24 | 125 | 48 | 16 | 117 | 66 | 21 |
| 15 | 193 | 48 | 25 | 123 | 45 | 15 | 123 | 42 | 14 |
| 16 | 185 | 37 | 18 | 121 | 46 | 15 | 132 | 42 | 15 |
| 17 | 170 | 52 | 24 | 119 | 43 | 14 | 139 | 45 | 17 |
| 18 | 165 | 66 | 29 | 119 | 38 | 12 | 139 | 44 | 17 |
| 19 | 162 | 46 | 20 | 117 | 28 | 8.8 | 136 | 58 | 21 |
| 20 | 155 | 46 | 19 | 119 | 39 | 13 | 143 | 52 | 20 |
| 21 | 150 | 42 | 17 | 117 | 46 | 15 | 150 | 88 | 36 |
| 22 | 143 | 46 | 18 | 117 | 45 | 14 | 141 | 68 | 26 |
| 23 | 143 | 43 | 17 | 117 | 41 | 13 | 136 | 54 | 20 |
| 24 | 148 | 64 | 26 | 117 | 34 | 11 | 134 | 49 | 18 |
| 25 | 162 | 81 | 35 | 106 | 30 | 8.6 | 132 | 51 | 18 |
| 26 | 160 | 66 | 29 | 104 | 37 | 10 | 132 | 41 | 15 |
| 27 | 153 | 56 | 23 | 100 | 35 | 9.5 | 134 | 34 | 12 |
| 28 | 157 | 42 | 18 | 102 | 40 | 11 | 132 | 34 | 12 |
| 29 | 162 | 49 | 21 | 106 | 45 | 13 | 130 | 32 | 11 |
| 30 | 155 | 42 | 18 | 128 | 58 | 20 | 132 | 38 | 14 |
| 31 | 148 | 46 | 18 | 123 | 62 | 21 | -- | -- | -- |
| TOTAL | 6565 | -- | 1047 | 3929 | -- | 528.9 | 3910 | -- | 692 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 89369
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 59429.4

## 06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.

LOCATION.--Lat 45°44'08", long 107°33'27", in NE¼NE¼ sec.19, T.1 S., R.34 E., Big Horn County, at gaging station at bridge on Sarpy Road, 0.2 mile upstream from terminal wasteway of Agency Canal, 0.6 mile upstream from mouth, and 2.3 miles east of Hardin.

DRAINAGE AREA.--1,294 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1969 to September 1971.
Water temperatures: October 1969 to September 1971.
Sediment records: October 1969 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 701 mg/l Apr. 1-12; minimum, 258 mg/l June 12-22.
Hardness: Maximum, 390 mg/l Apr. 1-12; minimum, 190 mg/l Feb. 1-19.
Specific conductance: Maximum daily, 1,150 micromhos Apr. 5; minimum daily, 412 micromhos Feb. 15.
Water temperatures: Maximum observed, 30.0°C Aug. 9, 12; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 02-31 | -- | 233 | -- | 6.7 | -- | 65 | 37 | 52 | 2.9 | 277 | 0 | 180 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 226 | -- | 6.4 | -- | 56 | 38 | 48 | 3.1 | 239 | 0 | 190 |
| DEC. | | | | | | | | | | | | |
| 01-20 | -- | 195 | -- | 7.3 | -- | 64 | 40 | 52 | 3.3 | 266 | 0 | 200 |
| 21-31 | -- | 145 | -- | 8.7 | -- | 75 | 43 | 51 | 3.3 | 298 | 0 | 200 |
| JAN. | | | | | | | | | | | | |
| 01-31 | -- | 178 | -- | 9.5 | 130 | 63 | 37 | 44 | 3.0 | 269 | 0 | 170 |
| FEB. | | | | | | | | | | | | |
| 01-19 | -- | 599 | -- | 6.3 | 60 | 44 | 20 | 32 | 5.0 | 162 | -- | 140 |
| 20-28 | -- | 633 | -- | 8.6 | 80 | 74 | 34 | 61 | 4.8 | 266 | -- | 200 |
| MAR. | | | | | | | | | | | | |
| 01-09 | -- | 404 | -- | 10 | 40 | 68 | 43 | 98 | 4.6 | 294 | -- | 300 |
| 11-25 | -- | 844 | -- | 9.1 | 40 | 58 | 34 | 84 | 5.6 | 252 | -- | 260 |
| 26-31 | -- | 1290 | -- | 8.8 | 60 | 51 | 27 | 54 | 5.3 | 205 | -- | 190 |
| APR. | | | | | | | | | | | | |
| 01-12 | -- | 546 | -- | 13 | 20 | 80 | 46 | 84 | 4.1 | 315 | 0 | 310 |
| 13-30 | -- | 564 | -- | 9.6 | 20 | 72 | 42 | 69 | 3.9 | 291 | 0 | 270 |
| MAY | | | | | | | | | | | | |
| 01-06 | -- | 484 | -- | 9.5 | 10 | 71 | 43 | 67 | 3.7 | 300 | 0 | 250 |
| 07-14 | -- | 523 | -- | 7.5 | 20 | 61 | 33 | 42 | 2.5 | 265 | 0 | 160 |
| 15-27 | -- | 531 | -- | 7.1 | 10 | 60 | 29 | 34 | 2.3 | 253 | 0 | 130 |
| JUNE | | | | | | | | | | | | |
| 01-09 | -- | 1100 | -- | 7.6 | 10 | 52 | 20 | 21 | 1.7 | 230 | 0 | 65 |
| 12-22 | -- | 1050 | -- | 7.1 | 10 | 50 | 18 | 14 | 1.4 | 222 | 0 | 57 |
| 23-30 | -- | 575 | -- | 7.0 | 10 | 54 | 20 | 20 | 1.6 | 229 | 0 | 78 |
| JULY | | | | | | | | | | | | |
| 01-14 | -- | 298 | -- | 7.3 | 10 | 56 | 32 | 40 | 2.6 | 252 | 0 | 160 |
| 15-31 | -- | 150 | -- | 7.6 | 10 | 57 | 39 | 54 | 3.3 | 255 | 0 | 200 |
| AUG. | | | | | | | | | | | | |
| 01-31 | -- | 146 | -- | 7.6 | 10 | 55 | 34 | 44 | 2.7 | 241 | 0 | 190 |
| SEP. | | | | | | | | | | | | |
| 01-29 | -- | 192 | -- | 6.9 | 10 | 57 | 35 | 44 | 2.5 | 238 | 0 | 180 |
| WTD. AVG. | -- | -- | -- | 8.1 | -- | 59 | 32 | 49 | 3.4 | 247 | 0 | 179 |
| TIME WTD. AVG. | -- | 392 | -- | 7.9 | -- | 60 | 35 | 50 | 3.2 | 254 | 0 | 187 |
| TONS PER DAY | -- | -- | -- | 8.6 | -- | 63 | 34 | 52 | 3.6 | 262 | 0 | 189 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 02... | 1500 | 320 | -- | 7.8 | 0 | 74 | 36 | 48 | 2.6 | 307 | 0 | 190 |
| MAR., 1971 | | | | | | | | | | | | |
| 10... | 1300 | 484 | .5 | 8.1 | 160 | 75 | 42 | 74 | 4.2 | 268 | 0 | 260 |
| JUNE | | | | | | | | | | | | |
| 02... | 1130 | 1080 | 13.5 | 6.9 | 30 | 52 | 24 | 27 | 1.7 | 240 | 0 | 100 |
| SEP. | | | | | | | | | | | | |
| 14... | 1400 | 151 | 17.0 | 6.8 | 20 | 57 | 35 | 42 | 2.5 | 258 | 0 | 180 |

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment concentrations: Maximum daily, 4,040 mg/l Mar. 27; minimum daily, 18 mg/l Oct. 28.
Sediment discharge: Maximum daily, 18,200 tons Mar. 27; minimum daily, 12 tons Oct. 28.

Period of record:
Dissolved solids: Maximum, 749 mg/l Apr. 1-6, 1970; minimum, 258 mg/l June 12-22, 1971.
Hardness: Maximum, 390 mg/l Apr. 1-12, 1971; minimum, 190 mg/l Feb. 1-19, 1971.
Specific conductance: Maximum daily, 1,160 micromhos Apr. 2, 4, 1970; minimum daily, 412 micromhos Feb. 15, 1971.
Water temperatures: Maximum observed, 30.0°C Aug. 9, 12, 1971; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 4,280 mg/l May 9, 1970; minimum daily, 10 mg/l Oct. 12, 1969.
Sediment discharge: Maximum daily, 25,300 tons May 9, 1970; minimum daily, 4 tons Oct. 2, 1969.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive difinition of water quality at this station. Stream frozen Nov. 21 to Mar. 14.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 02-31 | 2.0 | .2 | -- | -- | 481 | .67 | 308 | 310 | 86 | 1.3 | 727 | 8.0 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 3.2 | .2 | -- | -- | 465 | .64 | 287 | 300 | 100 | 1.2 | 686 | 8.1 |
| DEC. | | | | | | | | | | | | |
| 01-20 | 2.4 | .2 | -- | -- | 498 | .69 | 269 | 320 | 110 | 1.3 | 762 | 8.0 |
| 21-31 | 3.0 | .2 | -- | -- | 535 | .73 | 211 | 360 | 120 | 1.2 | 795 | 8.2 |
| JAN. | | | | | | | | | | | | |
| 01-31 | 3.0 | .2 | .00 | .00 | 460 | .63 | 221 | 310 | 89 | 1.1 | 702 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 01-19 | 2.8 | .5 | .10 | .03 | 331 | .45 | 535 | 190 | 59 | 1.0 | 503 | 8.2 |
| 20-28 | 4.0 | .5 | .10 | .06 | 518 | .70 | 885 | 320 | 110 | 1.5 | 835 | 8.2 |
| MAR. | | | | | | | | | | | | |
| 01-09 | 5.1 | .2 | .10 | .00 | 674 | .92 | 735 | 350 | 110 | 2.3 | 1010 | 8.3 |
| 11-25 | 4.6 | .1 | .10 | .00 | 580 | .79 | 1320 | 280 | 78 | 2.2 | 898 | 8.1 |
| 26-31 | 3.3 | .1 | .20 | .00 | 441 | .60 | 1540 | 240 | 70 | 1.5 | 713 | 8.0 |
| APR. | | | | | | | | | | | | |
| 01-12 | 8.1 | .3 | .01 | .03 | 701 | .95 | 1030 | 390 | 130 | 1.9 | 1040 | 8.2 |
| 13-30 | 3.6 | .2 | .06 | .03 | 614 | .84 | 935 | 350 | 110 | 1.6 | 933 | 8.0 |
| MAY | | | | | | | | | | | | |
| 01-06 | 3.5 | .3 | .04 | .03 | 596 | .81 | 779 | 350 | 110 | 1.6 | 960 | 8.2 |
| 07-14 | 2.0 | .2 | .00 | .00 | 439 | .60 | 620 | 290 | 71 | 1.1 | 695 | 8.1 |
| 15-27 | 2.1 | .2 | .01 | .00 | 389 | .53 | 558 | 270 | 62 | .9 | 640 | 8.2 |
| JUNE | | | | | | | | | | | | |
| 01-09 | 1.4 | .2 | .01 | .00 | 282 | .38 | 838 | 210 | 24 | .6 | 468 | 8.0 |
| 12-22 | 1.4 | .3 | .00 | .00 | 258 | .35 | 731 | 200 | 17 | .4 | 407 | 7.6 |
| 23-30 | 2.9 | .3 | .00 | .03 | 296 | .40 | 460 | 220 | 29 | .6 | 477 | 7.9 |
| JULY | | | | | | | | | | | | |
| 01-14 | 3.5 | .7 | .00 | .03 | 426 | .58 | 343 | 270 | 65 | 1.1 | 674 | 8.0 |
| 15-31 | 3.4 | .6 | .01 | .00 | 490 | .67 | 198 | 300 | 94 | 1.4 | 770 | 8.2 |
| AUG. | | | | | | | | | | | | |
| 01-31 | 2.0 | .1 | .00 | .00 | 454 | .62 | 179 | 280 | 80 | 1.2 | 708 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 01-29 | 4.3 | .3 | .02 | .03 | 447 | .61 | 232 | 290 | 91 | 1.1 | 699 | 8.2 |
| WTD. AVG. | 3.2 | .3 | -- | -- | 456 | .62 | -- | 278 | 76 | 1.3 | 708 | 8.1 |
| TIME WTD. AVG. | 3.2 | .3 | -- | -- | 471 | .64 | -- | 293 | 85 | 1.3 | 725 | 8.1 |
| TONS PER DAY | 3.4 | .3 | -- | -- | 482 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 02... | 2.6 | .3 | -- | -- | 509 | .72 | 454 | 330 | 81 | 1.1 | 797 | 8.3 |
| MAR., 1971 | | | | | | | | | | | | |
| 10... | 6.2 | .3 | .10 | .20 | 610 | .83 | 797 | 360 | 140 | 1.7 | 947 | 8.1 |
| JUNE | | | | | | | | | | | | |
| 02... | 1.5 | .2 | .18 | .06 | 332 | .45 | 968 | 230 | 32 | .8 | 550 | 7.9 |
| SEP. | | | | | | | | | | | | |
| 14... | 1.5 | .2 | .02 | .03 | 452 | .61 | 184 | 290 | 75 | 1.1 | 694 | 8.1 |

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED-PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 02... | 1230 | 210 | .030 | -- | -- |
| NOV. | | | | | |
| 19... | 1200 | 232 | .030 | -- | -- |
| DEC. | | | | | |
| 02... | 1500 | 320 | .000 | 80 | -- |
| JAN., 1971 | | | | | |
| 06... | 1445 | 136 | .000 | -- | -- |
| FEB. | | | | | |
| 09... | 1430 | 179 | .000 | -- | -- |
| MAR. | | | | | |
| 10... | 1300 | 484 | .10 | 120 | 60 |
| APR. | | | | | |
| 13... | 1030 | 465 | .080 | -- | -- |
| MAY | | | | | |
| 08... | 1245 | 515 | .060 | -- | -- |
| JUNE | | | | | |
| 02... | 1130 | 1080 | .030 | 30 | 0 |
| JULY | | | | | |
| 09... | 1115 | 253 | .020 | -- | -- |
| AUG. | | | | | |
| 11... | 1200 | 130 | .010 | -- | -- |
| SEP. | | | | | |
| 14... | 1400 | 151 | .070 | 110 | 10 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | 762 | 773 | 771 | 576 | 997 | 940 | 977 | 541 | 582 | 706 | 701 |
| 2 | 700 | 764 | 785 | 777 | 597 | 1030 | 926 | 1040 | --- | 607 | 692 | 717 |
| 3 | 700 | 768 | 831 | 777 | 846 | 1060 | 1020 | 1020 | 468 | 608 | 703 | 719 |
| 4 | 700 | 764 | 829 | 775 | 802 | 1060 | 1120 | 1010 | 537 | 608 | 706 | 717 |
| 5 | 700 | 764 | 831 | 818 | 802 | 1050 | 1150 | 835 | 450 | 638 | 706 | 717 |
| 6 | 703 | 764 | 806 | 861 | --- | 1060 | 1130 | 902 | --- | 609 | 705 | 710 |
| 7 | 708 | 768 | 779 | 775 | --- | 997 | 1130 | 733 | 577 | --- | 706 | 717 |
| 8 | 713 | --- | 754 | 793 | 851 | 993 | 1050 | 761 | 457 | 582 | 705 | 717 |
| 9 | 743 | 762 | 785 | 747 | 851 | 757 | 952 | 706 | 448 | 596 | 705 | 688 |
| 10 | 708 | --- | 806 | 820 | 875 | 1000 | 952 | 664 | --- | 647 | 718 | 684 |
| 11 | 753 | 764 | 836 | 838 | 872 | 929 | 978 | 689 | 455 | --- | 705 | 684 |
| 12 | 720 | 764 | 806 | 773 | 571 | 723 | 984 | 674 | 424 | 650 | 701 | 688 |
| 13 | 717 | 764 | 806 | 793 | --- | 685 | 952 | 792 | 421 | 696 | 705 | 702 |
| 14 | 718 | 782 | 838 | 765 | 414 | 721 | 952 | 669 | 444 | 684 | 705 | --- |
| 15 | 718 | 760 | 813 | 805 | 412 | 724 | 984 | 610 | 431 | 715 | 687 | 699 |
| 16 | 774 | 801 | 833 | 818 | 451 | 848 | 1020 | 575 | 421 | 715 | 689 | 690 |
| 17 | 753 | 768 | 831 | 861 | 458 | 898 | 1010 | 572 | 421 | 709 | 697 | 687 |
| 18 | 736 | 782 | 813 | 861 | 501 | 963 | 991 | 575 | 424 | 776 | 703 | 699 |
| 19 | 743 | 782 | 857 | 738 | 598 | 1040 | 1010 | 561 | 431 | 769 | 701 | --- |
| 20 | 753 | 780 | 811 | 723 | 778 | 1060 | 987 | 612 | 433 | 798 | 692 | 694 |
| 21 | 743 | --- | 885 | 718 | 778 | 828 | 981 | 678 | 421 | 803 | 705 | 687 |
| 22 | 743 | 825 | 923 | 729 | 846 | 909 | 1010 | 694 | 444 | 827 | 697 | 701 |
| 23 | 747 | 851 | 923 | 626 | 959 | 1010 | 1000 | 637 | 461 | 825 | 689 | 701 |
| 24 | 770 | 849 | 912 | 721 | 903 | 948 | 987 | 771 | 461 | 776 | 689 | 702 |
| 25 | 753 | 784 | 909 | 729 | 982 | 1030 | 984 | 713 | 483 | 776 | 690 | 710 |
| 26 | 736 | 810 | 909 | 775 | 996 | 627 | 897 | 706 | 484 | 801 | --- | 687 |
| 27 | 734 | 835 | 915 | 775 | 959 | 626 | 734 | 859 | 492 | 798 | --- | 694 |
| 28 | 753 | 828 | 806 | 775 | 959 | 568 | 897 | --- | 522 | 769 | --- | 687 |
| 29 | 762 | 788 | 880 | 833 | --- | 631 | 929 | --- | 525 | 738 | --- | 687 |
| 30 | 772 | 814 | 833 | 752 | --- | 745 | 1080 | 444 | 544 | 720 | 758 | --- |
| 31 | 772 | --- | 806 | 689 | --- | 826 | --- | 484 | --- | 720 | 758 | --- |
| MONTH | 735 | 787 | 836 | 775 | 745 | 882 | 991 | 723 | 467 | 708 | 705 | 699 |
| YEAR | 759 | | | | | | | | | | | |

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 12.5 | 17.0 | 19.5 | 28.0 | 24.0 |
| 2 | 15.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.0 | 13.0 | --- | 20.0 | 27.5 | 21.0 |
| 3 | 15.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 14.0 | 18.0 | 20.0 | 28.5 | 22.0 |
| 4 | 15.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 15.0 | 16.0 | 21.5 | 27.0 | 22.0 |
| 5 | 13.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 17.0 | 17.5 | 21.5 | 27.0 | 23.5 |
| 6 | 9.5 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 14.0 | 17.0 | 23.0 | 27.5 | 24.0 |
| 7 | 8.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 | 14.0 | 16.0 | --- | 29.0 | 24.0 |
| 8 | 7.5 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 | 15.0 | 18.0 | 23.5 | 29.0 | 22.0 |
| 9 | 8.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 15.5 | 18.5 | 25.0 | 30.0 | 21.5 |
| 10 | 8.0 | --- | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 16.0 | --- | 25.0 | 29.0 | 20.0 |
| 11 | 9.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 11.5 | 16.5 | --- | --- | 29.0 | 19.0 |
| 12 | 9.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.5 | 17.0 | 20.0 | 26.5 | 30.0 | 18.5 |
| 13 | 9.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.0 | 17.0 | 20.0 | 26.0 | 29.5 | 18.0 |
| 14 | 9.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.0 | 17.0 | 20.0 | 25.0 | 29.5 | --- |
| 15 | 9.0 | 4.5 | 0.0 | 0.0 | 0.0 | 2.5 | 13.0 | 17.5 | 17.5 | 26.0 | 27.5 | 16.0 |
| 16 | 9.5 | 4.5 | 0.0 | 0.0 | 0.0 | 3.5 | 13.5 | 17.0 | 20.0 | 26.5 | 28.0 | 13.0 |
| 17 | 9.5 | 5.0 | 0.0 | 0.0 | 0.0 | 3.0 | 15.0 | 17.0 | 20.5 | 26.5 | 28.0 | 14.0 |
| 18 | 9.5 | 4.5 | 0.0 | 0.0 | 0.0 | 2.5 | 14.5 | 16.5 | 22.0 | 26.0 | 27.0 | 15.5 |
| 19 | 10.0 | 4.0 | 0.0 | 0.0 | 0.0 | 3.0 | 14.5 | 16.5 | 21.0 | 27.0 | 26.5 | --- |
| 20 | 10.0 | 4.5 | 0.0 | 0.0 | 0.0 | 2.5 | 14.0 | 17.0 | 23.0 | 27.0 | 25.0 | 15.0 |
| 21 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 14.0 | 17.0 | 24.5 | 28.0 | 25.0 | 15.0 |
| 22 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 14.5 | 17.0 | 25.0 | 27.5 | 24.5 | 14.5 |
| 23 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 14.5 | 18.0 | 23.0 | 25.0 | 26.0 | 13.0 |
| 24 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 15.0 | 18.0 | 23.0 | 26.0 | 27.5 | 12.5 |
| 25 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 15.0 | 18.0 | 22.5 | 24.0 | 25.0 | 13.0 |
| 26 | 6.5 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 14.5 | 15.0 | 21.0 | 24.5 | --- | 13.5 |
| 27 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 12.5 | 17.0 | 21.0 | 24.0 | --- | 13.5 |
| 28 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 12.0 | --- | 17.0 | 25.0 | --- | 14.0 |
| 29 | 5.0 | 0.0 | 0.0 | 0.0 | --- | 6.0 | 12.0 | --- | 15.0 | 25.0 | --- | 14.0 |
| 30 | 4.5 | 0.0 | 0.0 | 0.0 | --- | 6.5 | 13.0 | 12.0 | 19.0 | 24.5 | 25.0 | --- |
| 31 | 4.0 | --- | 0.0 | 0.0 | --- | 5.5 | --- | 12.0 | --- | 24.5 | 24.5 | --- |
| MONTH | 9.0 | 3.0 | 0.0 | 0.0 | 0.0 | 2.5 | 12.0 | 16.0 | 19.5 | 24.5 | 27.5 | 17.5 |
| YEAR | 10.5 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM |
|---|---|---|---|---|---|---|---|---|---|---|
| MAR. | | | | | | | | | | |
| 10... | 1410 | .5 | 495 | 483 | 646 | 40 | 57 | 87 | 94 | 100 |
| 13... | 1810 | 3.5 | 1620 | 3020 | 13200 | 33 | 48 | 84 | 96 | 100 |
| 26... | 1815 | 6.0 | 1010 | 3090 | 8430 | 44 | 60 | 96 | 100 | -- |
| 27... | 1725 | 5.5 | 1670 | 4340 | 19600 | 30 | 46 | 80 | 94 | 100 |
| APR. | | | | | | | | | | |
| 13... | 1015 | 8.5 | 476 | 350 | 450 | 66 | 85 | 93 | 96 | 100 |
| 26... | 1735 | 14.5 | 1100 | 5380 | 16000 | 49 | 70 | 92 | 98 | 100 |
| 27... | 1720 | 12.5 | 1080 | 2760 | 8050 | 71 | 88 | 100 | -- | -- |
| MAY | | | | | | | | | | |
| 08... | 1230 | 17.0 | 510 | 279 | 384 | 44 | 66 | 90 | 95 | 100 |
| JUNE | | | | | | | | | | |
| 01... | 1310 | 12.5 | 1170 | 1010 | 3190 | 42 | 62 | 90 | 96 | 100 |

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 219 | 64 | 38 | 229 | 34 | 21 | 286 | 290 | 224 |
| 2 | 213 | 70 | 40 | 229 | 34 | 21 | 300 | 338 | 274 |
| 3 | 215 | 59 | 34 | 225 | 41 | 25 | 290 | 97 | 76 |
| 4 | 220 | 46 | 27 | 229 | 33 | 20 | 250 | 79 | 53 |
| 5 | 220 | 51 | 30 | 229 | 32 | 20 | 160 | 86 | 37 |
| 6 | 221 | 51 | 30 | 220 | 32 | 19 | 165 | 107 | 48 |
| 7 | 217 | 48 | 28 | 229 | 29 | 18 | 170 | 117 | 54 |
| 8 | 227 | 49 | 30 | 229 | 29 | 18 | 175 | 121 | 57 |
| 9 | 227 | 51 | 31 | 229 | 28 | 17 | 185 | 98 | 49 |
| 10 | 228 | 47 | 29 | 238 | 40 | 26 | 190 | 70 | 36 |
| 11 | 233 | 39 | 25 | 239 | 53 | 34 | 190 | 65 | 33 |
| 12 | 247 | 30 | 20 | 248 | 45 | 30 | 190 | 71 | 36 |
| 13 | 238 | 62 | 40 | 243 | 52 | 34 | 190 | 86 | 44 |
| 14 | 238 | 49 | 31 | 247 | 56 | 37 | 190 | 70 | 36 |
| 15 | 224 | 29 | 18 | 251 | 42 | 28 | 185 | 66 | 33 |
| 16 | 238 | 53 | 34 | 243 | 48 | 31 | 175 | 75 | 35 |
| 17 | 251 | 52 | 35 | 238 | 53 | 34 | 170 | 72 | 33 |
| 18 | 241 | 51 | 33 | 238 | 50 | 32 | 160 | 68 | 29 |
| 19 | 254 | 51 | 35 | 233 | 42 | 26 | 150 | 50 | 20 |
| 20 | 237 | 42 | 27 | 238 | 40 | 26 | 130 | 58 | 20 |
| 21 | 233 | 37 | 23 | 230 | 66 | 41 | 100 | 58 | 16 |
| 22 | 233 | 32 | 20 | 170 | 102 | 47 | 105 | 58 | 16 |
| 23 | 238 | 31 | 20 | 110 | 148 | 44 | 110 | 49 | 15 |
| 24 | 238 | 36 | 23 | 160 | 114 | 49 | 120 | 61 | 20 |
| 25 | 238 | 44 | 28 | 210 | 130 | 74 | 130 | 49 | 17 |
| 26 | 238 | 41 | 26 | 230 | 120 | 75 | 140 | 46 | 17 |
| 27 | 238 | 23 | 15 | 250 | 97 | 65 | 160 | 54 | 23 |
| 28 | 243 | 18 | 12 | 220 | 104 | 62 | 170 | 74 | 34 |
| 29 | 243 | 25 | 16 | 240 | 112 | 73 | 180 | 63 | 31 |
| 30 | 238 | 36 | 23 | 270 | 358 | 261 | 190 | 73 | 37 |
| 31 | 229 | 31 | 19 | -- | -- | -- | 190 | 72 | 37 |
| TOTAL | 7217 | -- | 840 | 6794 | -- | 1308 | 5496 | -- | 1490 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 185 | 49 | 24 | 270 | 75 | 55 | 450 | 71 | 86 |
| 2 | 175 | 71 | 34 | 220 | 58 | 34 | 400 | 67 | 72 |
| 3 | 165 | 71 | 32 | 200 | 83 | 45 | 360 | 187 | 182 |
| 4 | 155 | 58 | 24 | 195 | 37 | 19 | 330 | 85 | 76 |
| 5 | 145 | 52 | 20 | 190 | 26 | 13 | 360 | 129 | 125 |
| 6 | 135 | 60 | 22 | 185 | 39 | 19 | 410 | 173 | 192 |
| 7 | 140 | 60 | 23 | 185 | 46 | 23 | 470 | 205 | 260 |
| 8 | 150 | 78 | 32 | 180 | 62 | 30 | 410 | 228 | 252 |
| 9 | 160 | 90 | 39 | 175 | 85 | 40 | 450 | 722 | 877 |
| 10 | 170 | 93 | 43 | 170 | 113 | 52 | 495 | 836 | 1120 |
| 11 | 170 | 84 | 39 | 200 | 76 | 41 | 710 | 356 | 682 |
| 12 | 160 | 88 | 38 | 420 | 121 | 137 | 1120 | 1100 | 3330 |
| 13 | 160 | 82 | 35 | 1000 | 174 | 470 | 1620 | 2580 | 11300 |
| 14 | 150 | 77 | 31 | 1700 | 197 | 904 | 1410 | 1500 | 5710 |
| 15 | 140 | 87 | 33 | 1500 | 219 | 887 | 1240 | 1620 | 5420 |
| 16 | 130 | 88 | 31 | 1300 | 250 | 878 | 956 | 1410 | 3640 |
| 17 | 120 | 111 | 36 | 1200 | 287 | 930 | 723 | 741 | 1450 |
| 18 | 130 | 104 | 37 | 1100 | 282 | 838 | 616 | 437 | 727 |
| 19 | 150 | 77 | 31 | 1000 | 158 | 427 | 526 | 409 | 581 |
| 20 | 170 | 110 | 50 | 900 | 119 | 289 | 555 | 523 | 784 |
| 21 | 190 | 106 | 54 | 800 | 131 | 283 | 880 | 922 | 2190 |
| 22 | 210 | 75 | 43 | 700 | 98 | 185 | 693 | 817 | 1530 |
| 23 | 240 | 69 | 45 | 600 | 85 | 138 | 531 | 675 | 968 |
| 24 | 230 | 72 | 45 | 500 | 95 | 128 | 506 | 494 | 675 |
| 25 | 220 | 40 | 24 | 600 | 83 | 134 | 573 | 537 | 831 |
| 26 | 210 | 26 | 15 | 570 | 86 | 132 | 935 | 2290 | 5970 |
| 27 | 200 | 36 | 19 | 540 | 106 | 155 | 1670 | 4040 | 18200 |
| 28 | 190 | 55 | 28 | 490 | 157 | 208 | 1870 | 2750 | 13900 |
| 29 | 220 | 40 | 24 | -- | -- | -- | 1270 | 1760 | 6040 |
| 30 | 260 | 133 | 93 | -- | -- | -- | 1020 | 1140 | 3140 |
| 31 | 300 | 174 | 141 | -- | -- | -- | 999 | 1070 | 2890 |
| TOTAL | 5530 | -- | 1185 | 17090 | -- | 7494 | 24558 | -- | 93200 |

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 895 | 972 | 2350 | 531 | 385 | 552 | 1220 | 793 | 2610 |
| 2 | 511 | 738 | 1020 | 491 | 351 | 465 | 1140 | 606 | 1870 |
| 3 | 521 | 531 | 747 | 466 | 423 | 532 | 1120 | 610 | 1840 |
| 4 | 480 | 304 | 394 | 461 | 366 | 456 | 1070 | 988 | 2850 |
| 5 | 506 | 234 | 320 | 461 | 299 | 372 | 1080 | 960 | 2800 |
| 6 | 505 | 234 | 319 | 491 | 282 | 374 | 1080 | 679 | 1980 |
| 7 | 510 | 257 | 354 | 501 | 294 | 398 | 1100 | 835 | 2480 |
| 8 | 516 | 257 | 358 | 523 | 306 | 432 | 1080 | 751 | 2190 |
| 9 | 549 | 414 | 614 | 534 | 280 | 404 | 1040 | 570 | 1600 |
| 10 | 521 | 522 | 734 | 533 | 261 | 376 | 1150 | 679 | 2110 |
| 11 | 516 | 383 | 534 | 535 | 256 | 370 | 1370 | 1130 | 4180 |
| 12 | 516 | 324 | 451 | 509 | 214 | 294 | 1290 | 765 | 2660 |
| 13 | 476 | 324 | 416 | 504 | 256 | 348 | 1240 | 613 | 2050 |
| 14 | 446 | 320 | 385 | 543 | 221 | 324 | 1170 | 480 | 1520 |
| 15 | 427 | 306 | 353 | 598 | 290 | 468 | 1120 | 375 | 1130 |
| 16 | 413 | 234 | 261 | 648 | 433 | 758 | 1090 | 504 | 1480 |
| 17 | 409 | 189 | 209 | 667 | 416 | 749 | 1050 | 446 | 1260 |
| 18 | 395 | 167 | 178 | 664 | 391 | 701 | 1000 | 608 | 1640 |
| 19 | 373 | 158 | 159 | 573 | 328 | 507 | 989 | 670 | 1790 |
| 20 | 395 | 153 | 163 | 512 | 214 | 296 | 922 | 524 | 1300 |
| 21 | 396 | 153 | 164 | 461 | 157 | 195 | 864 | 475 | 1110 |
| 22 | 428 | 181 | 209 | 434 | 180 | 211 | 789 | 399 | 850 |
| 23 | 562 | 423 | 642 | 509 | 166 | 228 | 709 | 252 | 482 |
| 24 | 597 | 950 | 1530 | 520 | 198 | 278 | 657 | 242 | 429 |
| 25 | 441 | 960 | 1140 | 450 | 171 | 208 | 619 | 242 | 404 |
| 26 | 1100 | 3810 | 11300 | 425 | 161 | 185 | 564 | 195 | 297 |
| 27 | 1080 | 3740 | 10900 | 436 | 232 | 273 | 552 | 198 | 295 |
| 28 | 911 | 1900 | 4670 | 500 | 314 | 424 | 528 | 166 | 237 |
| 29 | 672 | 894 | 1620 | 717 | 648 | 1250 | 505 | 138 | 188 |
| 30 | 639 | 646 | 1110 | 1020 | 1160 | 3190 | 467 | 141 | 178 |
| 31 | -- | -- | -- | 1290 | 1420 | 4950 | -- | -- | -- |
| TOTAL | 16706 | -- | 43604 | 17507 | -- | 20568 | 28575 | -- | 45810 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 427 | 118 | 136 | 173 | 68 | 32 | 247 | 119 | 79 |
| 2 | 379 | 113 | 116 | 178 | 55 | 26 | 215 | 119 | 69 |
| 3 | 348 | 122 | 115 | 171 | 62 | 29 | 198 | 81 | 43 |
| 4 | 346 | 112 | 105 | 162 | 51 | 22 | 181 | 69 | 34 |
| 5 | 351 | 103 | 98 | 162 | 57 | 25 | 201 | 73 | 40 |
| 6 | 331 | 98 | 88 | 156 | 57 | 24 | 202 | 75 | 41 |
| 7 | 301 | 98 | 80 | 160 | 60 | 26 | 193 | 92 | 48 |
| 8 | 281 | 111 | 84 | 156 | 64 | 27 | 180 | 112 | 54 |
| 9 | 257 | 104 | 72 | 152 | 70 | 29 | 205 | 69 | 38 |
| 10 | 252 | 97 | 66 | 154 | 66 | 27 | 206 | 61 | 34 |
| 11 | 243 | 105 | 69 | 151 | 66 | 27 | 193 | 54 | 28 |
| 12 | 243 | 115 | 75 | 150 | 80 | 32 | 181 | 56 | 27 |
| 13 | 225 | 97 | 59 | 139 | 76 | 29 | 175 | 72 | 34 |
| 14 | 184 | 85 | 42 | 131 | 65 | 23 | 165 | 82 | 37 |
| 15 | 183 | 78 | 39 | 128 | 63 | 22 | 170 | 78 | 36 |
| 16 | 175 | 79 | 37 | 133 | 62 | 22 | 176 | 64 | 30 |
| 17 | 171 | 93 | 43 | 132 | 59 | 21 | 192 | 54 | 28 |
| 18 | 161 | 81 | 35 | 139 | 61 | 23 | 195 | 65 | 34 |
| 19 | 134 | 74 | 27 | 137 | 60 | 22 | 183 | 65 | 32 |
| 20 | 126 | 76 | 26 | 136 | 56 | 21 | 181 | 65 | 32 |
| 21 | 131 | 77 | 27 | 131 | 56 | 20 | 196 | 57 | 30 |
| 22 | 120 | 70 | 23 | 138 | 53 | 20 | 208 | 62 | 35 |
| 23 | 116 | 72 | 23 | 138 | 56 | 21 | 212 | 62 | 35 |
| 24 | 103 | 84 | 23 | 126 | 53 | 18 | 205 | 58 | 32 |
| 25 | 122 | 87 | 29 | 124 | 72 | 24 | 190 | 51 | 26 |
| 26 | 130 | 71 | 25 | 127 | 68 | 23 | 182 | 61 | 30 |
| 27 | 139 | 61 | 23 | 127 | 57 | 20 | 180 | 65 | 32 |
| 28 | 147 | 84 | 33 | 120 | 54 | 17 | 179 | 57 | 28 |
| 29 | 176 | 92 | 44 | 109 | 60 | 18 | 182 | 52 | 26 |
| 30 | 200 | 78 | 42 | 176 | 115 | 55 | 179 | 54 | 26 |
| 31 | 208 | 74 | 42 | 206 | 112 | 62 | -- | -- | -- |
| TOTAL | 6710 | -- | 1746 | 4522 | -- | 807 | 5752 | -- | 1098 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 146457
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 219150

## 06294700 BIGHORN RIVER AT BIGHORN, MONT.
(Irrigation network station)

LOCATION.--Lat 46°08'50", long 107°28'00", in NE¼NE¼ sec.33, T.5 N., R.34 E., Treasure County, at gaging station at bridge on old U.S. Highway 10, 0.3 mile downstream from bridge on Interstate Highway 94, 0.7 mile upstream from mouth, 1.3 miles southwest of Bighorn, and 4.4 miles east of Custer.

DRAINAGE AREA.--22,885 sq mi.

PERIOD OF RECORD.--Chemical analyses: November 1945 to August 1947, August 1948, March 1949 to September 1971.
Water temperatures: April 1949 to September 1951, August 1952 to November 1958, June 1959 to September 1971.
{ Maximum temperature of 31.5°C on Aug. 7, 1953, published in WSP 1291 and subsequent publications, has been
{ found to be incorrect and should not be used.
Sediment records: May 1946 to September 1954, October 1955 to September 1958, October 1959 to September 1971.
Prior to October 1948, published as "near Custer."

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 1,080 micromhos Oct. 25; minimum daily, 567 micromhos Aug. 21.
Water temperatures: Maximum, 23.0°C Aug. 6, 8, 9; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 05... | 1140 | 2760 | -- | 7.4 | 0 | 79 | 29 | 95 | 4.2 | 204 | 0 | 340 |
| NOV. 09... | 1300 | 2970 | 8.5 | 10 | 10 | 77 | 27 | 94 | 3.3 | 215 | 0 | 320 |
| DEC. 01... | 1230 | 3100 | 4.5 | 10 | 190 | 74 | 28 | 84 | 2.3 | 209 | 0 | 280 |
| JAN. 25... | 1200 | 3930 | 1.0 | 10 | 120 | 70 | 24 | 69 | 3.9 | 191 | 0 | 250 |
| FEB. 12... | 1115 | 6500 | .5 | 8.8 | 140 | 72 | 23 | 70 | 4.2 | 191 | 0 | 260 |
| MAR. 04... | 1350 | 4820 | 3.0 | 10 | 100 | 83 | 32 | 88 | 3.9 | 226 | 0 | 300 |
| APR. 13... | 1245 | 6420 | 5.5 | 9.7 | 10 | 83 | 29 | 85 | 3.9 | 230 | -- | 320 |
| MAY 07... | 1230 | 6340 | 10.5 | 9.5 | 20 | 85 | 30 | 81 | 6.1 | 226 | -- | 290 |
| JUNE 15... | 1015 | 9160 | 16.0 | 7.0 | 20 | 75 | 28 | 90 | 3.4 | 213 | 0 | 270 |
| JULY 06... | 1030 | 6300 | 18.0 | 8.2 | 10 | 58 | 22 | 33 | 3.1 | 176 | 0 | 150 |
| AUG. 02... | 1150 | 5100 | 20.0 | 9.5 | 20 | 49 | 16 | 52 | 2.5 | 160 | 0 | 170 |
| SEP. 08... | 1130 | 3030 | 18.0 | 10 | 20 | 50 | 18 | 52 | 3.0 | 160 | 0 | 180 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 916 | 968 | 882 | 814 | 878 | 952 | 912 | 975 | 883 | 734 | 602 | 621 |
| 2 | 916 | 950 | 906 | 817 | 875 | 943 | 929 | 972 | 901 | 730 | 600 | 607 |
| 3 | 921 | 947 | 882 | 814 | 870 | 958 | 950 | 969 | 912 | 723 | 588 | 594 |
| 4 | 953 | 938 | 877 | 814 | 929 | 958 | 947 | 954 | 910 | 711 | 608 | 592 |
| 5 | 965 | 938 | 857 | 835 | 929 | 928 | 968 | 954 | 910 | 713 | 601 | 595 |
| 6 | 984 | 947 | 867 | 842 | 923 | 931 | 974 | 942 | 888 | 713 | 601 | 607 |
| 7 | 997 | 941 | 880 | 842 | 960 | 974 | 974 | 939 | 888 | 698 | 601 | 616 |
| 8 | 997 | 938 | 860 | 814 | --- | 958 | 959 | 939 | 886 | 679 | 581 | 607 |
| 9 | 1010 | 938 | 845 | 817 | --- | 955 | 947 | 914 | 886 | 704 | 585 | 594 |
| 10 | 997 | 915 | 838 | 838 | --- | 903 | 944 | 912 | 875 | 695 | 579 | 594 |
| 11 | 1010 | 915 | 857 | 860 | 823 | 895 | 950 | 906 | 858 | 686 | 577 | 582 |
| 12 | 1010 | 941 | 877 | 894 | 823 | 876 | 950 | 912 | 858 | 678 | 574 | 594 |
| 13 | 1010 | 944 | 857 | 916 | 614 | 874 | 944 | 912 | 851 | 676 | 578 | 582 |
| 14 | 1010 | 918 | 845 | 933 | 610 | 823 | 944 | 912 | 858 | 663 | 574 | 577 |
| 15 | 1010 | 929 | 852 | 942 | 629 | 868 | 938 | 912 | 860 | 659 | 574 | 573 |
| 16 | 1010 | 910 | 845 | 916 | 711 | 897 | 947 | 899 | 851 | 659 | 569 | 571 |
| 17 | 1010 | 912 | 855 | 842 | 643 | 900 | 941 | 899 | 841 | 664 | 571 | 569 |
| 18 | 1020 | 910 | 845 | 817 | 789 | 914 | 968 | 906 | 841 | 661 | 569 | 573 |
| 19 | 1020 | 915 | 870 | 842 | 818 | 990 | 974 | 899 | 841 | 644 | 589 | 582 |
| 20 | 1010 | 918 | 862 | 817 | 900 | 990 | 974 | 909 | 827 | 642 | 577 | 582 |
| 21 | 1010 | 910 | 857 | 817 | 944 | 974 | 974 | 914 | 816 | 644 | 567 | 604 |
| 22 | 1010 | 912 | 845 | 778 | 960 | 903 | 968 | 912 | 816 | 644 | 580 | 632 |
| 23 | 1010 | 915 | 857 | 828 | 986 | 931 | 971 | 912 | 816 | 642 | 589 | 667 |
| 24 | 1030 | 912 | 836 | 821 | 875 | 961 | 1010 | 934 | 805 | 638 | 581 | 707 |
| 25 | 1080 | 888 | 836 | 817 | 873 | 1010 | 990 | 939 | 805 | 632 | 585 | 743 |
| 26 | 1010 | 886 | 852 | 819 | 860 | 990 | 974 | 937 | 797 | 627 | 588 | 758 |
| 27 | 997 | 901 | 838 | 894 | 875 | 961 | 959 | 934 | 784 | 616 | 571 | 786 |
| 28 | 984 | 910 | 833 | 916 | 944 | 868 | 944 | 934 | 774 | 615 | 571 | 792 |
| 29 | 981 | 912 | 836 | 819 | --- | 827 | 971 | 925 | 770 | 613 | 580 | 803 |
| 30 | 981 | 915 | 833 | 819 | --- | 876 | 971 | 906 | 776 | 605 | 578 | 805 |
| 31 | 977 | --- | 826 | 838 | --- | 895 | --- | 864 | --- | 596 | 608 | --- |
| MONTH | 995 | 923 | 855 | 845 | 842 | 925 | 959 | 924 | 846 | 665 | 584 | 637 |
| YEAR | 833 | | | | | | | | | | | |

06294700 BIGHORN RIVER AT BIGHORN, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment concentrations: Maximum daily, 1,790 mg/l Feb. 14; minimum daily, 14 mg/l Nov. 21.
Sediment discharge: Maximum daily, 61,900 tons Feb. 14; minimum daily, 51 tons Oct. 23.

Period of record:
Specific conductance (1951-71): Maximum daily, 1,940 micromhos July 10, 1961; minimum daily, 384 micromhos June 20, 1951.
Water temperatures (1949-51, 1952-71): Maximum observed, 30.0°C July 17, 18, 1953; minimum, freezing point on many days during winter periods.
Sediment concentrations (1947-54, 1955-58, 1959-71): Maximum daily, 23,200 mg/l May 24, 1952; minimum daily, 8 mg/l Oct. 31, 1967.
Sediment discharge (1947-54, 1955-58, 1959-71): Maximum daily, 727,000 tons May 24, 1952; minimum daily, 46 tons Oct. 31, 1967.

REMARKS.--Flow affected by ice Nov. 23, Dec. 20, 21, 23, Jan. 4-7, 12-21, Jan. 31 to Feb. 12, Feb. 28 to Mar. 2, Mar. 21-23.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 05... | 11 | .5 | -- | 100 | 664 | .92 | 5070 | 320 | 150 | 2.3 | 936 | 8.3 |
| NOV. | | | | | | | | | | | | |
| 09... | 11 | .4 | -- | 130 | 647 | .90 | 5290 | 300 | 120 | 2.4 | 946 | 7.9 |
| DEC. | | | | | | | | | | | | |
| 01... | 8.4 | .4 | -- | 110 | 595 | .83 | 5130 | 300 | 130 | 2.1 | 923 | 7.6 |
| JAN. | | | | | | | | | | | | |
| 25... | 8.1 | .4 | .00 | -- | 530 | .72 | 5620 | 270 | 113 | 1.8 | 740 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 12... | 9.1 | .4 | .00 | -- | 540 | .73 | 9480 | 270 | 113 | 1.8 | 747 | 7.4 |
| MAR. | | | | | | | | | | | | |
| 04... | 12 | .5 | .10 | 100 | 640 | .87 | 8330 | 340 | 155 | 2.1 | 983 | 8.3 |
| APR. | | | | | | | | | | | | |
| 13... | 11 | .4 | .30 | -- | 657 | .89 | 11400 | 330 | 140 | 2.0 | 943 | 8.3 |
| MAY | | | | | | | | | | | | |
| 07... | 13 | .3 | .30 | -- | 628 | .85 | 10800 | 340 | 150 | 1.9 | 954 | 8.0 |
| JUNE | | | | | | | | | | | | |
| 15... | 9.8 | .4 | .25 | 90 | 590 | .80 | 14600 | 300 | 130 | 2.3 | 926 | 8.0 |
| JULY | | | | | | | | | | | | |
| 06... | 7.6 | .6 | .37 | -- | 371 | .50 | 6310 | 240 | 91 | .9 | 599 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 02... | 5.5 | 1.0 | .19 | -- | 385 | .52 | 5300 | 190 | 57 | 1.7 | 598 | 7.9 |
| SEP. | | | | | | | | | | | | |
| 08... | 6.9 | .8 | .53 | 140 | 402 | .55 | 3290 | 200 | 68 | 1.6 | 609 | 7.6 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.0 | 7.0 | 5.0 | 2.5 | 0.0 | 0.0 | 3.5 | 10.0 | 10.5 | 19.0 | 19.0 | 19.5 |
| 2 | 13.0 | 7.0 | 5.0 | 1.0 | 0.0 | 0.0 | 4.0 | 10.0 | 12.0 | 18.0 | 19.0 | 19.0 |
| 3 | 13.5 | 7.0 | 5.0 | 0.0 | 0.0 | 1.0 | 4.0 | 10.0 | 12.5 | 18.0 | 19.0 | 18.0 |
| 4 | 14.5 | 6.5 | 5.0 | 0.0 | 0.0 | 1.0 | 4.5 | 10.0 | 13.5 | 19.0 | 21.5 | 15.5 |
| 5 | 14.0 | 7.0 | 4.5 | 0.0 | 0.0 | 1.0 | 4.5 | 10.5 | 13.0 | 17.0 | 21.0 | 17.0 |
| 6 | 10.5 | 8.0 | 5.0 | 0.0 | 0.0 | 0.5 | 6.0 | 10.0 | 15.0 | 17.5 | 23.0 | 19.0 |
| 7 | 8.5 | 9.5 | 6.0 | 0.0 | 0.0 | 0.5 | 6.0 | 10.0 | 13.0 | 16.5 | 22.5 | 18.5 |
| 8 | 8.5 | 10.5 | 7.5 | 0.0 | --- | 3.0 | 7.0 | 9.5 | 13.0 | 16.0 | 23.0 | 16.5 |
| 9 | 8.5 | 9.5 | 5.0 | 0.0 | --- | 3.0 | 10.0 | 12.5 | 17.0 | 18.0 | 23.0 | 16.0 |
| 10 | 8.5 | 9.0 | 3.0 | 0.0 | --- | 4.0 | 8.0 | 9.0 | 16.0 | 21.0 | 21.0 | 17.0 |
| 11 | 10.5 | 8.5 | 2.0 | 0.0 | 0.0 | 4.0 | 6.5 | 8.5 | 16.5 | 20.0 | 20.5 | 17.0 |
| 12 | 11.0 | 8.0 | 4.0 | 0.0 | 2.0 | 2.5 | 6.5 | 10.0 | 16.0 | 19.0 | 21.5 | 17.0 |
| 13 | 9.5 | 8.0 | 3.0 | 0.0 | 3.0 | 4.0 | 4.0 | 10.5 | 18.5 | 17.5 | 22.5 | 16.0 |
| 14 | 9.0 | 8.5 | 4.5 | 0.0 | 4.0 | 3.0 | 6.0 | 11.0 | 17.0 | 18.0 | 21.5 | 14.5 |
| 15 | 10.0 | 9.0 | 6.0 | 0.0 | 3.0 | 3.0 | 8.5 | 10.0 | 16.0 | 17.5 | 22.5 | 13.5 |
| 16 | 14.5 | 9.0 | 5.0 | 0.0 | 3.0 | 3.0 | 6.0 | 12.5 | 16.0 | 20.0 | 21.5 | 12.0 |
| 17 | 15.0 | 9.5 | 4.0 | 0.0 | 2.5 | 2.5 | 7.0 | 8.0 | 16.0 | 20.5 | 20.5 | 12.0 |
| 18 | 13.5 | 7.0 | 0.5 | 0.0 | 2.5 | 2.0 | 7.0 | 7.0 | 16.0 | 20.0 | 21.0 | 10.5 |
| 19 | 13.0 | 8.5 | 0.5 | 0.0 | 1.5 | 2.0 | 5.5 | 7.5 | 17.0 | 19.0 | 20.0 | 13.0 |
| 20 | 10.5 | 6.5 | 0.0 | 0.5 | 2.0 | 5.0 | 6.0 | 9.0 | 17.0 | 18.5 | 20.0 | 13.5 |
| 21 | 10.0 | 3.5 | 0.0 | 1.0 | 3.5 | 2.0 | 7.0 | 9.5 | 19.0 | 20.0 | 20.0 | 11.5 |
| 22 | 8.5 | 0.0 | 0.0 | 1.0 | 4.0 | 0.0 | 6.5 | 8.0 | 17.5 | 19.5 | 20.0 | 11.0 |
| 23 | 8.5 | 0.0 | 0.5 | 1.5 | 5.0 | 0.0 | 6.5 | 10.0 | 18.0 | 20.5 | 20.0 | 12.0 |
| 24 | 7.5 | 5.5 | 1.0 | 1.5 | 4.5 | 2.0 | 8.5 | 9.5 | 18.5 | 20.5 | 17.0 | 13.0 |
| 25 | 7.5 | 4.5 | 2.5 | 1.0 | 4.0 | 3.5 | 7.0 | 11.0 | 18.5 | 18.0 | 17.5 | 15.0 |
| 26 | 6.5 | 3.0 | 0.5 | 0.0 | 2.0 | 4.0 | 5.5 | 10.5 | 17.5 | 16.5 | 19.5 | 14.5 |
| 27 | 6.0 | 1.0 | 1.0 | 1.0 | 0.0 | 5.0 | 6.0 | 13.5 | 16.0 | 18.5 | 21.0 | 12.5 |
| 28 | 6.5 | 2.0 | 0.5 | 5.0 | 0.0 | 5.5 | 6.0 | 13.5 | 14.0 | 17.0 | 21.5 | 13.0 |
| 29 | 6.0 | 5.0 | 3.5 | 2.5 | --- | 6.0 | 7.5 | 13.5 | 14.0 | 15.0 | 21.5 | 13.0 |
| 30 | 8.0 | 3.0 | 2.0 | 0.0 | --- | 6.5 | 7.0 | 10.0 | 14.0 | 17.0 | 18.5 | 12.5 |
| 31 | 8.0 | --- | --- | 0.0 | --- | 4.0 | --- | 10.0 | --- | 17.0 | 18.5 | --- |
| MONTH | 10.0 | 6.5 | 3.0 | 0.5 | 2.0 | 2.5 | 6.5 | 10.0 | 15.5 | 18.5 | 20.5 | 15.0 |
| YEAR | 9.5 | | | | | | | | | | | |

06294700 BIGHORN RIVER AT BIGHORN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 1990 | 34 | 183 | 3280 | 22 | 195 | 3080 | 26 | 216 |
| 2 | 2010 | 30 | 163 | 3380 | 31 | 283 | 3050 | 24 | 198 |
| 3 | 2720 | 67 | 492 | 3580 | 37 | 358 | 3080 | 25 | 208 |
| 4 | 2800 | 76 | 575 | 3660 | 32 | 316 | 3050 | 26 | 214 |
| 5 | 2760 | 90 | 671 | 3640 | 34 | 334 | 2970 | 19 | 152 |
| 6 | 2820 | 54 | 411 | 3640 | 34 | 334 | 2930 | 23 | 182 |
| 7 | 2720 | 29 | 213 | 3680 | 38 | 378 | 2990 | 55 | 444 |
| 8 | 2760 | 24 | 179 | 3660 | 37 | 366 | 3420 | 58 | 536 |
| 9 | 2800 | 26 | 197 | 2970 | 24 | 192 | 3990 | 36 | 388 |
| 10 | 2900 | 30 | 235 | 3700 | 31 | 310 | 4010 | 56 | 606 |
| 11 | 2860 | 30 | 232 | 3660 | 48 | 474 | 3950 | 49 | 523 |
| 12 | 2880 | 34 | 264 | 3680 | 38 | 378 | 3910 | 48 | 507 |
| 13 | 3080 | 35 | 291 | 3680 | 37 | 368 | 3910 | 48 | 507 |
| 14 | 3030 | 42 | 344 | 3660 | 32 | 316 | 3910 | 86 | 908 |
| 15 | 3160 | 42 | 358 | 3660 | 29 | 287 | 4240 | 96 | 1100 |
| 16 | 2910 | 40 | 314 | 3680 | 30 | 298 | 4370 | 91 | 1070 |
| 17 | 2700 | 31 | 226 | 3680 | 32 | 318 | 4410 | 91 | 1080 |
| 18 | 2690 | 30 | 218 | 3600 | 33 | 321 | 4750 | 136 | 1740 |
| 19 | 2670 | 24 | 173 | 3100 | 20 | 167 | 4800 | 102 | 1320 |
| 20 | 2970 | 50 | 401 | 3080 | 15 | 125 | 4700 | 130 | 1650 |
| 21 | 3360 | 58 | 526 | 3070 | 14 | 116 | 4700 | 91 | 1150 |
| 22 | 3260 | 37 | 326 | 2990 | 16 | 129 | 4730 | 86 | 1100 |
| 23 | 1180 | 16 | 51 | 2800 | 27 | 204 | 4700 | 106 | 1350 |
| 24 | 1400 | 20 | 76 | 3340 | 44 | 397 | 4730 | 72 | 920 |
| 25 | 3240 | 50 | 437 | 3740 | 40 | 404 | 4730 | 58 | 741 |
| 26 | 3260 | 40 | 352 | 3420 | 37 | 342 | 4730 | 50 | 639 |
| 27 | 3300 | 33 | 294 | 3070 | 25 | 207 | 4730 | 70 | 894 |
| 28 | 3260 | 28 | 246 | 3050 | 18 | 148 | 4750 | 64 | 821 |
| 29 | 3260 | 25 | 220 | 3030 | 20 | 164 | 4750 | 56 | 718 |
| 30 | 3280 | 25 | 221 | 3080 | 23 | 191 | 4770 | 62 | 798 |
| 31 | 3300 | 24 | 214 | -- | -- | -- | 4800 | 74 | 959 |
| TOTAL | 87330 | -- | 9103 | 102260 | -- | 8420 | 127640 | -- | 23639 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 4800 | 74 | 959 | 4000 | 104 | 1120 | 4600 | 63 | 782 |
| 2 | 4770 | 50 | 644 | 4000 | 88 | 950 | 4600 | 34 | 422 |
| 3 | 4730 | 50 | 639 | 3700 | 40 | 400 | 4930 | 34 | 453 |
| 4 | 4700 | 32 | 406 | 3500 | 30 | 284 | 4820 | 57 | 742 |
| 5 | 4700 | 26 | 330 | 3500 | 30 | 284 | 4820 | 57 | 742 |
| 6 | 4700 | 36 | 457 | 3400 | 23 | 211 | 5130 | 60 | 831 |
| 7 | 4400 | 86 | 1020 | 3300 | 36 | 321 | 5210 | 74 | 1040 |
| 8 | 3950 | 44 | 469 | 3400 | 38 | 349 | 5280 | 74 | 1050 |
| 9 | 3720 | 55 | 552 | 4000 | 150 | 1620 | 5430 | 120 | 1760 |
| 10 | 3580 | 32 | 309 | 4500 | 240 | 2920 | 5980 | 239 | 3860 |
| 11 | 3540 | 29 | 277 | 5500 | 546 | 8110 | 6630 | 399 | 7140 |
| 12 | 3400 | 25 | 230 | 6500 | 973 | 17100 | 7100 | 547 | 10500 |
| 13 | 3300 | 56 | 499 | 10400 | 1470 | 42800 | 7800 | 764 | 16100 |
| 14 | 3200 | 74 | 639 | 12800 | 1790 | 61900 | 7420 | 752 | 15100 |
| 15 | 3300 | 221 | 1970 | 11400 | 1110 | 34200 | 6820 | 422 | 7770 |
| 16 | 4000 | 79 | 853 | 9210 | 596 | 14800 | 6340 | 353 | 6040 |
| 17 | 5200 | 118 | 1660 | 6780 | 385 | 7050 | 5980 | 230 | 3710 |
| 18 | 5800 | 260 | 4070 | 5130 | 205 | 2840 | 5410 | 160 | 2340 |
| 19 | 6000 | 200 | 3240 | 3820 | 160 | 1650 | 4930 | 120 | 1600 |
| 20 | 6000 | 326 | 5280 | 3840 | 148 | 1530 | 5260 | 136 | 1930 |
| 21 | 5700 | 294 | 4520 | 3800 | 114 | 1170 | 5500 | 203 | 3010 |
| 22 | 4710 | 295 | 3750 | 3640 | 74 | 727 | 5200 | 217 | 3050 |
| 23 | 4350 | 184 | 2160 | 4200 | 114 | 1290 | 5500 | 160 | 2380 |
| 24 | 4140 | 100 | 1120 | 4600 | 234 | 2910 | 5570 | 131 | 1970 |
| 25 | 3910 | 60 | 633 | 5240 | 279 | 3950 | 6060 | 194 | 3170 |
| 26 | 3860 | 46 | 479 | 5100 | 162 | 2230 | 6440 | 222 | 3860 |
| 27 | 3820 | 42 | 433 | 4820 | 47 | 612 | 7340 | 479 | 9490 |
| 28 | 3820 | 59 | 609 | 4700 | 57 | 723 | 8040 | 918 | 19900 |
| 29 | 4560 | 156 | 1920 | -- | -- | -- | 7900 | 656 | 14000 |
| 30 | 4710 | 175 | 2230 | -- | -- | -- | 7120 | 416 | 8000 |
| 31 | 4000 | 84 | 907 | -- | -- | -- | 6850 | 353 | 6530 |
| TOTAL | 135370 | -- | 43264 | 148780 | -- | 214051 | 186010 | -- | 159272 |

06294700 BIGHORN RIVER AT BIGHORN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 6820 | 252 | 4640 | 6300 | 365 | 6210 | 8790 | 420 | 9970 |
| 2 | 6420 | 229 | 3970 | 6180 | 239 | 3990 | 9290 | 763 | 19100 |
| 3 | 6150 | 215 | 3570 | 6130 | 165 | 2730 | 9370 | 771 | 19500 |
| 4 | 6180 | 173 | 2890 | 6150 | 148 | 2460 | 9260 | 433 | 10800 |
| 5 | 6080 | 148 | 2430 | 6220 | 148 | 2490 | 9260 | 334 | 8350 |
| 6 | 6130 | 148 | 2450 | 6270 | 137 | 2320 | 8530 | 297 | 6840 |
| 7 | 6370 | 160 | 2750 | 6300 | 155 | 2640 | 8790 | 319 | 7570 |
| 8 | 6220 | 200 | 3360 | 5730 | 158 | 2440 | 8820 | 280 | 6670 |
| 9 | 6340 | 148 | 2530 | 6390 | 171 | 2950 | 9080 | 282 | 6910 |
| 10 | 6540 | 171 | 3020 | 6460 | 152 | 2650 | 9370 | 268 | 6780 |
| 11 | 6420 | 180 | 3120 | 6460 | 131 | 2280 | 9780 | 370 | 9770 |
| 12 | 6390 | 154 | 2660 | 6370 | 131 | 2250 | 9700 | 422 | 11100 |
| 13 | 6390 | 114 | 1970 | 7000 | 157 | 2970 | 9310 | 376 | 9450 |
| 14 | 6270 | 129 | 2180 | 8070 | 285 | 6210 | 9110 | 327 | 8040 |
| 15 | 6270 | 86 | 1460 | 8480 | 336 | 7690 | 9110 | 260 | 6400 |
| 16 | 6220 | 67 | 1130 | 8480 | 277 | 6340 | 9110 | 230 | 5660 |
| 17 | 6250 | 68 | 1150 | 8430 | 234 | 5330 | 8980 | 209 | 5070 |
| 18 | 6220 | 66 | 1110 | 8530 | 218 | 5020 | 8950 | 189 | 4570 |
| 19 | 4880 | 44 | 580 | 8270 | 203 | 4530 | 8480 | 172 | 3940 |
| 20 | 5590 | 101 | 1520 | 8590 | 247 | 5730 | 8480 | 171 | 3920 |
| 21 | 4970 | 79 | 1060 | 8220 | 211 | 4680 | 8430 | 156 | 3550 |
| 22 | 5640 | 81 | 1230 | 8270 | 189 | 4220 | 8480 | 151 | 3460 |
| 23 | 6060 | 114 | 1870 | 8510 | 261 | 6000 | 8400 | 150 | 3400 |
| 24 | 6320 | 296 | 5050 | 8590 | 314 | 7280 | 8100 | 133 | 2910 |
| 25 | 6220 | 365 | 6130 | 8300 | 359 | 8050 | 8300 | 113 | 2530 |
| 26 | 6730 | 408 | 7410 | 8250 | 283 | 6300 | 8270 | 110 | 2460 |
| 27 | 7800 | 1270 | 26700 | 8270 | 219 | 4890 | 8100 | 110 | 2410 |
| 28 | 7270 | 1020 | 20000 | 8170 | 199 | 4390 | 7970 | 111 | 2390 |
| 29 | 6820 | 855 | 15700 | 7900 | 188 | 4010 | 7640 | 96 | 1980 |
| 30 | 6560 | 595 | 10500 | 8380 | 218 | 4930 | 7620 | 97 | 2000 |
| 31 | -- | -- | -- | 8740 | 362 | 8540 | -- | -- | -- |
| TOTAL | 188540 | -- | 144140 | 232410 | -- | 142520 | 262880 | -- | 197500 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 7640 | 99 | 2040 | 5020 | 66 | 895 | 3140 | 74 | 627 |
| 2 | 7470 | 105 | 2120 | 5060 | 60 | 820 | 3010 | 61 | 496 |
| 3 | 7420 | 107 | 2140 | 3990 | 56 | 603 | 3120 | 58 | 489 |
| 4 | 6630 | 100 | 1790 | 3520 | 49 | 466 | 3200 | 58 | 501 |
| 5 | 6440 | 96 | 1670 | 3460 | 44 | 411 | 2930 | 62 | 490 |
| 6 | 6270 | 92 | 1560 | 3480 | 47 | 442 | 2840 | 98 | 751 |
| 7 | 6080 | 114 | 1870 | 3500 | 50 | 473 | 2530 | 143 | 977 |
| 8 | 5730 | 91 | 1410 | 3540 | 49 | 468 | 2950 | 139 | 1110 |
| 9 | 5730 | 93 | 1440 | 3460 | 44 | 411 | 2900 | 136 | 1060 |
| 10 | 5730 | 91 | 1410 | 3420 | 41 | 379 | 2820 | 107 | 815 |
| 11 | 5730 | 93 | 1440 | 3420 | 41 | 379 | 2780 | 60 | 450 |
| 12 | 5710 | 91 | 1400 | 3560 | 45 | 433 | 2720 | 56 | 411 |
| 13 | 5620 | 89 | 1350 | 3680 | 54 | 537 | 2700 | 48 | 350 |
| 14 | 5980 | 92 | 1490 | 3160 | 41 | 350 | 2690 | 39 | 283 |
| 15 | 6150 | 118 | 1960 | 3120 | 41 | 345 | 2700 | 32 | 233 |
| 16 | 6560 | 145 | 2570 | 3180 | 44 | 378 | 2700 | 26 | 190 |
| 17 | 6580 | 139 | 2470 | 3260 | 44 | 387 | 2720 | 27 | 198 |
| 18 | 5870 | 99 | 1570 | 3100 | 40 | 335 | 2760 | 26 | 194 |
| 19 | 5570 | 84 | 1260 | 3380 | 48 | 438 | 2760 | 24 | 179 |
| 20 | 5460 | 89 | 1310 | 3440 | 42 | 390 | 2760 | 26 | 194 |
| 21 | 4970 | 77 | 1030 | 2780 | 35 | 263 | 2820 | 23 | 175 |
| 22 | 4560 | 75 | 923 | 2400 | 42 | 272 | 2820 | 20 | 152 |
| 23 | 4560 | 68 | 837 | 2400 | 41 | 266 | 2880 | 32 | 249 |
| 24 | 5130 | 85 | 1180 | 2350 | 36 | 228 | 2880 | 62 | 482 |
| 25 | 4620 | 61 | 761 | 2350 | 39 | 247 | 2860 | 40 | 309 |
| 26 | 4220 | 54 | 615 | 2380 | 41 | 263 | 2840 | 34 | 261 |
| 27 | 4660 | 67 | 843 | 2420 | 37 | 242 | 2840 | 29 | 222 |
| 28 | 4840 | 61 | 797 | 2460 | 40 | 266 | 2840 | 26 | 199 |
| 29 | 4750 | 62 | 795 | 2480 | 41 | 275 | 2860 | 22 | 170 |
| 30 | 4690 | 51 | 646 | 2910 | 67 | 526 | 2860 | 23 | 178 |
| 31 | 4430 | 56 | 670 | 3220 | 134 | 1160 | -- | -- | -- |
| TOTAL | 175800 | -- | 43367 | 99900 | -- | 13348 | 85230 | -- | 12395 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 1832150
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 1011019

06294700 BIGHORN RIVER AT BIGHORN, MONT.--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM |
|---|---|---|---|---|---|---|---|---|---|---|
| APR. 27... | 0830 | 6.0 | 8070 | 1480 | 32200 | 58 | 77 | 95 | 98 | 100 |

06296120 YELLOWSTONE RIVER NEAR MILES CITY, MONT.

LOCATION.--Lat 46°23'51", long 105°53'36", in SE¼SW¼ sec.31, T.8 N., R.47 E., Custer County, at Keogh Bridge, 1.6 miles upstream from Tongue River, and 2 miles west of Miles City.

DRAINAGE AREA.--42,847 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.
Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:
Dissolved solids: Maximum, 532 mg/l Mar. 19-31; minimum, 183 mg/l June 12-30.
Hardness: Maximum, 270 mg/l Jan. 1-10, Mar. 19-31, Apr. 1-30; minimum, 97 mg/l July 6-15.
Specific conductance: Maximum daily, 861 micromhos Mar. 27; minimum daily, 257 micromhos June 27.
Water temperatures: Maximum, 26.5°C Aug. 8; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DISCHARGE (CFS) | TEMPERATURE (DEG C) | DISSOLVED SILICA (SIO2) (MG/L) | DISSOLVED IRON (FE) (UG/L) | DISSOLVED CALCIUM (CA) (MG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED SODIUM (NA) (MG/L) | DISSOLVED POTASSIUM (K) (MG/L) | BICARBONATE (HCO3) (MG/L) | CARBONATE (CO3) (MG/L) | DISSOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-15 | -- | 8320 | -- | 11 | -- | 57 | 20 | 54 | 4.0 | 180 | 0 | 170 |
| 16-31 | -- | 8060 | -- | 11 | -- | 58 | 21 | 57 | 4.3 | 192 | 0 | 180 |
| NOV. | | | | | | | | | | | | |
| 01-30 | -- | 7690 | -- | 11 | -- | 59 | 22 | 59 | 4.3 | 191 | 0 | 200 |
| DEC. | | | | | | | | | | | | |
| 01-17 | -- | 7490 | -- | 12 | -- | 57 | 21 | 57 | 4.0 | 184 | 0 | 190 |
| 18-31 | -- | 5900 | -- | 12 | -- | 64 | 24 | 68 | 4.3 | 200 | 0 | 230 |
| JAN. | | | | | | | | | | | | |
| 01-10 | -- | 7010 | -- | 14 | 80 | 69 | 24 | 64 | 4.1 | 166 | 21 | 210 |
| FEB. | | | | | | | | | | | | |
| 14-17 | -- | 33700 | -- | 7.8 | 140 | 37 | 10 | 29 | 4.6 | 121 | -- | 100 |
| MAR. | | | | | | | | | | | | |
| 01-18 | -- | 11500 | -- | 3.8 | 10 | 61 | 24 | 66 | 4.1 | 183 | 0 | 220 |
| 19-31 | -- | 11000 | -- | 12 | 20 | 66 | 25 | 68 | 4.3 | 196 | 0 | 250 |
| APR. | | | | | | | | | | | | |
| 01-30 | -- | 12200 | -- | 4.3 | 10 | 65 | 25 | 57 | 4.0 | 199 | 0 | 230 |
| MAY | | | | | | | | | | | | |
| 01-08 | -- | 15100 | -- | 14 | 10 | 59 | 20 | 55 | 3.7 | 201 | 0 | 180 |
| 09-31 | -- | 22400 | -- | 14 | 10 | 46 | 15 | 41 | 3.0 | 160 | 0 | 130 |
| JUNE | | | | | | | | | | | | |
| 01-11 | -- | 35100 | -- | 14 | 10 | 37 | 11 | 29 | 2.3 | 137 | 0 | 92 |
| 12-30 | -- | 49400 | -- | 12 | 10 | 29 | 7.9 | 20 | 2.0 | 108 | 0 | 56 |
| JULY | | | | | | | | | | | | |
| 01-05 | -- | 36500 | -- | 12 | 10 | 31 | 8.5 | 23 | 2.2 | 125 | 0 | 67 |
| 06-15 | -- | 31800 | -- | 12 | 20 | 26 | 7.8 | 21 | 2.2 | 102 | 0 | 61 |
| 16-31 | -- | 22200 | -- | 11 | 10 | 27 | 9.1 | 26 | 2.4 | 117 | 0 | 74 |
| AUG. | | | | | | | | | | | | |
| 01-15 | -- | 12800 | -- | 11 | 10 | 33 | 11 | 31 | 2.4 | 129 | 0 | 90 |
| 16-31 | -- | 8240 | -- | 11 | 20 | 39 | 14 | 38 | 2.7 | 149 | 0 | 110 |
| SEP. | | | | | | | | | | | | |
| 01-24 | -- | 10200 | -- | 12 | 0 | 41 | 14 | 36 | 3.0 | 152 | 0 | 110 |
| 25-30 | -- | 8410 | -- | 8.8 | 0 | 46 | 17 | 46 | 3.8 | 164 | 0 | 140 |
| WTD. AVG. | -- | -- | -- | 11 | -- | 43 | 14 | 38 | 3.0 | 148 | 0 | 124 |
| TIME WTD. AVG. | -- | 15800 | -- | 11 | -- | 50 | 18 | 47 | 3.4 | 165 | 1 | 155 |
| TONS PER DAY | -- | -- | -- | 476 | -- | 1820 | 616 | 1630 | 128 | 6290 | 13 | 5300 |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. 07... | 1140 | 6840 | -- | 12 | 60 | 58 | 21 | 55 | 4.1 | 192 | 0 | 190 |
| MAR., 1971 01... | 1345 | 8100 | 1.0 | 12 | 50 | 64 | 30 | 62 | 4.4 | 189 | -- | 230 |
| MAY 05... | 0800 | 14400 | 14.0 | 14 | 20 | 58 | 24 | 59 | 4.1 | 204 | -- | 200 |
| JUNE 07... | 1700 | 32000 | 15.0 | 13 | 40 | 36 | 12 | 29 | 1.9 | 123 | 0 | 98 |
| SEP. 01... | 1700 | 10300 | 22.0 | 12 | 30 | 41 | 15 | 46 | 3.4 | 167 | 0 | 130 |

06296120 YELLOWSTONE RIVER NEAR MILES CITY, MONT.--Continued

EXTREMES.--Continued

Period of record:
Dissolved solids: Maximum, 624 mg/l May 1-5, 1970; minimum, 179 mg/l June 1-17, 1969.
Hardness: Maximum, 290 mg/l May 1-5, 1970; minimum, 97 mg/l June 1-17, 1969, July 6-15, 1971.
Specific conductance: Maximum daily, 1,030 micromhos Jan. 10, 1970; minimum daily, 226 micromhos May 30, 1969.
Water temperatures: Maximum, 26.5°C Aug. 8, 1971; minimum, freezing point on many days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples were collected for more comprehensive definition of water quality at this station. Maximum observed during water year: Hardness, 280 mg/l Mar. 1. Water discharge computed by subtracting the discharge of station 06308500, Tongue River at Miles City from that of station 06309000, Yellowstone River at Miles City.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 01-15 | 8.0 | .5 | -- | -- | 413 | .56 | 9280 | 220 | 76 | 1.6 | 628 | 7.9 |
| 16-31 | 8.5 | .5 | -- | -- | 433 | .61 | 9820 | 230 | 75 | 1.6 | 684 | 7.8 |
| NOV. | | | | | | | | | | | | |
| 01-30 | 9.2 | .6 | -- | -- | 458 | .66 | 10000 | 240 | 79 | 1.7 | 680 | 8.0 |
| DEC. | | | | | | | | | | | | |
| 01-17 | 8.4 | .5 | -- | -- | 442 | .60 | 8920 | 230 | 77 | 1.6 | 662 | 8.0 |
| 18-31 | 11 | .4 | -- | -- | 511 | .72 | 8460 | 260 | 96 | 1.8 | 757 | 8.1 |
| JAN. | | | | | | | | | | | | |
| 01-10 | 9.6 | .5 | .20 | .10 | 500 | .68 | 9460 | 270 | 99 | 1.7 | 733 | 8.5 |
| FEB. | | | | | | | | | | | | |
| 14-17 | 4.3 | .5 | .30 | .03 | 254 | .35 | 23100 | 130 | 34 | 1.1 | 391 | 8.1 |
| MAR. | | | | | | | | | | | | |
| 01-18 | 14 | .3 | .12 | .06 | 484 | .66 | 15000 | 250 | 100 | 1.8 | 759 | 8.0 |
| 19-31 | 9.2 | .4 | .11 | .06 | 532 | .72 | 15800 | 270 | 110 | 1.8 | 820 | 8.2 |
| APR. | | | | | | | | | | | | |
| 01-30 | 2.9 | .3 | .20 | .03 | 487 | .66 | 16000 | 270 | 100 | 1.5 | 779 | 8.1 |
| MAY | | | | | | | | | | | | |
| 01-08 | 7.9 | .3 | .12 | .03 | 439 | .60 | 17900 | 230 | 65 | 1.6 | 679 | 8.2 |
| 09-31 | 5.2 | .3 | .06 | .03 | 333 | .45 | 20100 | 180 | 45 | 1.3 | 515 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 01-11 | 4.3 | .4 | .06 | .06 | 258 | .35 | 24500 | 140 | 25 | 1.1 | 388 | 7.9 |
| 12-30 | 3.0 | .4 | .00 | .06 | 183 | .25 | 24400 | 100 | 16 | .9 | 287 | 7.8 |
| JULY | | | | | | | | | | | | |
| 01-05 | 6.1 | .8 | .04 | .03 | 212 | .29 | 20900 | 110 | 10 | .9 | 336 | 8.0 |
| 06-15 | 4.3 | .7 | .00 | .03 | 185 | .25 | 15900 | 97 | 13 | .9 | 296 | 8.0 |
| 16-31 | 5.5 | .8 | .06 | .03 | 214 | .29 | 12800 | 100 | 9 | 1.1 | 339 | 7.8 |
| AUG. | | | | | | | | | | | | |
| 01-15 | 3.3 | .2 | .00 | .00 | 245 | .33 | 8470 | 130 | 22 | 1.2 | 403 | 7.8 |
| 16-31 | 4.2 | .2 | .10 | .03 | 293 | .40 | 6520 | 150 | 33 | 1.3 | 479 | 7.7 |
| SEP. | | | | | | | | | | | | |
| 01-24 | 7.0 | .4 | .02 | .03 | 298 | .41 | 8210 | 160 | 35 | 1.2 | 475 | 8.0 |
| 25-30 | 9.2 | .4 | .61 | .03 | 355 | .48 | 8060 | 180 | 50 | 1.5 | 559 | 8.1 |
| WTD. AVG. | 5.7 | .4 | -- | -- | 313 | .43 | -- | 166 | 44 | 1.3 | 487 | 7.9 |
| TIME WTD. AVG. | 6.8 | .4 | -- | -- | 373 | .51 | -- | 196 | 60 | 1.4 | 577 | 8.0 |
| TONS PER DAY | 242 | 19 | -- | -- | 13300 | -- | -- | -- | -- | -- | -- | -- |

ANALYSES OF ADDITIONAL SAMPLES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC. | | | | | | | | | | | | |
| 07... | 9.8 | .4 | -- | -- | 443 | .61 | 8240 | 230 | 74 | 1.6 | 668 | 7.0 |
| MAR., 1971 | | | | | | | | | | | | |
| 01... | 7.9 | .5 | .50 | .15 | 506 | .69 | 11100 | 280 | 130 | 1.6 | 746 | 7.9 |
| MAY | | | | | | | | | | | | |
| 05... | 9.5 | .7 | .30 | .12 | 471 | .64 | 18300 | 240 | 76 | 1.6 | 703 | 7.9 |
| JUNE | | | | | | | | | | | | |
| 07... | 3.9 | .3 | .04 | .09 | 255 | .35 | 22000 | 140 | 38 | 1.1 | 403 | 8.1 |
| SEP. | | | | | | | | | | | | |
| 01... | 8.1 | .9 | .34 | .06 | 340 | .46 | 9460 | 160 | 27 | 1.6 | 534 | 7.6 |

06296120 YELLOWSTONE RIVER NEAR MILES CITY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOL-VED PHOS-PHORUS (P) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 07... | 1225 | 8180 | .000 | -- | -- |
| NOV. | | | | | |
| 09... | 1225 | 8050 | .010 | -- | -- |
| DEC. | | | | | |
| 07... | 1140 | 6840 | .020 | 150 | -- |
| JAN., 1971 | | | | | |
| 11... | 1230 | 5120 | .000 | -- | -- |
| FEB. | | | | | |
| 08... | 1440 | 7300 | .020 | -- | -- |
| MAR. | | | | | |
| 01... | 1345 | 8100 | .010 | 170 | 38 |
| APR. | | | | | |
| 06... | 1515 | 11100 | .010 | -- | -- |
| MAY | | | | | |
| 05... | 0800 | 14400 | .070 | 180 | 50 |
| JUNE | | | | | |
| 07... | 1700 | 32000 | .040 | 60 | 0 |
| JULY | | | | | |
| 07... | 1410 | 34600 | .070 | -- | -- |
| AUG. | | | | | |
| 03... | 1630 | 15700 | .020 | -- | -- |
| SEP. | | | | | |
| 01... | 1700 | 10300 | .10 | 170 | 10 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 571 | 691 | 664 | 682 | --- | 752 | 774 | 725 | 368 | 319 | 394 | 525 |
| 2 | 579 | 699 | 663 | 696 | --- | 784 | 774 | 725 | 370 | 336 | 397 | 543 |
| 3 | 571 | 691 | 662 | 690 | --- | 801 | 756 | 734 | 401 | 350 | 397 | 488 |
| 4 | 576 | 691 | 662 | 704 | --- | 805 | 772 | 725 | 420 | 335 | 395 | 469 |
| 5 | 606 | 707 | 636 | 714 | --- | 805 | 797 | 692 | 442 | 323 | 399 | 466 |
| 6 | 639 | 717 | 636 | 729 | --- | 803 | 817 | 658 | 445 | 282 | 401 | 466 |
| 7 | 655 | 710 | 663 | 787 | --- | 792 | 838 | 616 | 405 | 283 | 400 | 469 |
| 8 | 655 | 709 | 672 | 783 | --- | 773 | 855 | 592 | 405 | 296 | 399 | 471 |
| 9 | 657 | 709 | 676 | 785 | --- | 782 | 855 | 586 | 401 | 288 | 403 | 459 |
| 10 | 662 | 707 | 687 | 808 | --- | 763 | 831 | 552 | 401 | 289 | 401 | 454 |
| 11 | 658 | 691 | 692 | 808 | --- | 733 | 819 | 528 | 379 | 301 | 397 | 447 |
| 12 | 667 | 720 | 695 | --- | --- | 724 | 808 | 499 | 357 | 303 | 405 | 443 |
| 13 | 670 | 707 | 695 | --- | --- | 705 | 797 | 499 | 330 | 290 | 420 | 443 |
| 14 | 668 | 715 | 676 | --- | 480 | 707 | 772 | 484 | 329 | 296 | 423 | 454 |
| 15 | 684 | 722 | 664 | --- | 371 | 707 | 776 | 492 | 326 | 301 | 436 | 456 |
| 16 | 681 | 709 | 680 | --- | 367 | 716 | 776 | 468 | 322 | 313 | 440 | 458 |
| 17 | 672 | 707 | 680 | --- | 404 | 744 | 791 | 459 | 312 | 327 | 449 | 459 |
| 18 | 684 | 722 | 748 | --- | 431 | 777 | 791 | 460 | 304 | 334 | 447 | 459 |
| 19 | 686 | 722 | 757 | --- | 469 | 763 | 776 | 460 | 300 | 334 | 458 | 476 |
| 20 | 684 | 707 | 749 | --- | 469 | 805 | 776 | 452 | 287 | 319 | 461 | 469 |
| 21 | 677 | 692 | 749 | --- | 522 | 825 | 738 | 501 | 296 | 319 | 467 | 473 |
| 22 | 683 | 688 | 819 | --- | 586 | 837 | 774 | 542 | 296 | 322 | 477 | 481 |
| 23 | 700 | 673 | 767 | --- | 658 | 827 | 766 | 580 | 282 | 329 | 500 | 507 |
| 24 | 708 | 710 | 806 | --- | 689 | 803 | 785 | 570 | 267 | 331 | 476 | 495 |
| 25 | 671 | 699 | 712 | --- | 718 | 837 | 793 | 604 | 272 | 332 | 492 | 521 |
| 26 | 591 | 724 | 791 | --- | 733 | 844 | 770 | 614 | 269 | 338 | 485 | 524 |
| 27 | 716 | 724 | 751 | --- | 716 | 861 | 754 | 611 | 257 | 343 | 492 | 566 |
| 28 | 715 | 648 | 763 | --- | 713 | 851 | 701 | 593 | 269 | 345 | 492 | 599 |
| 29 | 703 | 674 | 783 | --- | --- | 827 | 694 | 516 | 269 | 356 | 500 | 569 |
| 30 | 708 | 676 | 748 | --- | --- | 746 | 720 | 427 | 269 | 361 | 496 | 572 |
| 31 | 713 | --- | 748 | --- | --- | 762 | --- | 369 | --- | 365 | 516 | --- |
| MONTH | 662 | 702 | 713 | --- | --- | 783 | 782 | 559 | 335 | 321 | 442 | 489 |
| YEAR | 583 | | | | | | | | | | | |

06296120 YELLOWSTONE RIVER NEAR MILES CITY, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15.5 | 5.0 | 0.5 | 1.0 | --- | 0.0 | 7.0 | 12.0 | 11.0 | 16.5 | 21.0 | 22.0 |
| 2 | 15.5 | 5.0 | 0.5 | 0.0 | --- | 0.0 | 6.5 | 15.0 | 13.5 | 19.0 | 21.5 | 22.0 |
| 3 | 15.5 | 5.0 | 0.5 | 0.0 | --- | 1.5 | 8.0 | 15.5 | 15.5 | 18.5 | 23.0 | 19.5 |
| 4 | 16.0 | 5.0 | 0.0 | 0.5 | --- | 1.0 | 6.5 | 15.5 | 14.5 | 19.0 | 23.0 | 19.0 |
| 5 | 16.0 | 5.0 | 0.0 | 0.5 | --- | 1.0 | 8.0 | 15.5 | 16.0 | 19.0 | 25.5 | 17.0 |
| 6 | 11.5 | 5.0 | 0.5 | 0.0 | --- | 1.5 | 9.0 | 15.5 | 15.5 | 19.0 | 26.0 | 18.0 |
| 7 | 10.0 | 5.5 | 0.5 | 0.5 | --- | 2.0 | 9.5 | 15.5 | 15.5 | 19.0 | 25.5 | 19.5 |
| 8 | 10.0 | 5.5 | 0.5 | 1.0 | --- | 1.0 | 11.0 | 15.5 | 16.5 | 19.0 | 26.5 | 19.0 |
| 9 | 10.0 | 6.0 | 0.0 | 0.0 | --- | 1.0 | 11.0 | 15.5 | 17.0 | 19.0 | 25.5 | 19.5 |
| 10 | 9.5 | 5.5 | 0.0 | 0.0 | --- | 2.0 | 10.5 | 15.0 | 18.5 | 20.0 | 25.0 | 19.5 |
| 11 | 9.5 | 6.0 | 0.5 | 0.0 | --- | 2.0 | 11.0 | 14.5 | 19.0 | 20.0 | 24.5 | 21.0 |
| 12 | 10.0 | 5.5 | 1.0 | --- | --- | 3.5 | 10.0 | 15.5 | 18.5 | 20.0 | 25.5 | 19.0 |
| 13 | 10.0 | 5.5 | 1.0 | --- | --- | 3.5 | 10.5 | 16.5 | 18.0 | 21.0 | 26.0 | 19.0 |
| 14 | 9.5 | 6.5 | 0.5 | --- | 2.0 | 4.5 | 11.0 | 16.0 | 18.0 | 20.0 | 25.5 | 18.0 |
| 15 | 10.0 | 6.0 | 1.0 | --- | 2.0 | 4.5 | 11.0 | 15.0 | 18.0 | 20.5 | 24.5 | 15.5 |
| 16 | 10.0 | 6.5 | 0.5 | --- | 2.0 | 4.5 | 11.0 | 14.0 | 18.0 | 21.0 | 25.0 | 13.5 |
| 17 | 10.5 | 6.5 | 0.0 | --- | 2.0 | 4.5 | 11.0 | --- | 18.0 | 21.0 | 25.0 | 13.5 |
| 18 | 10.0 | 6.0 | 0.0 | --- | 1.0 | 4.5 | 10.0 | --- | 18.5 | 21.5 | 25.5 | 12.0 |
| 19 | 10.0 | 6.0 | 0.0 | --- | 0.5 | 5.0 | 9.0 | --- | 18.0 | 21.5 | 25.5 | 13.0 |
| 20 | 10.0 | 5.0 | 0.0 | --- | 0.0 | 4.5 | 10.0 | --- | 18.0 | 22.0 | 25.0 | 11.5 |
| 21 | 10.0 | 4.0 | 0.0 | --- | 1.0 | 4.5 | 9.0 | --- | 18.5 | 22.0 | 25.5 | 12.0 |
| 22 | 10.0 | 1.0 | 0.0 | --- | 1.0 | 3.5 | 10.0 | --- | 18.5 | 22.0 | 25.5 | 12.0 |
| 23 | 9.5 | 0.0 | 0.0 | --- | 1.0 | 4.5 | 11.0 | 11.0 | 19.5 | 23.0 | 23.5 | 12.0 |
| 24 | 9.5 | 3.5 | 0.0 | --- | 2.0 | 4.5 | 12.0 | 13.0 | 19.5 | 22.0 | 21.5 | 12.0 |
| 25 | 8.5 | 0.5 | 0.0 | --- | 1.0 | 4.5 | 11.0 | 14.5 | 19.5 | 20.5 | 22.0 | 13.5 |
| 26 | 8.5 | 0.5 | 0.0 | --- | 0.0 | 5.5 | 10.0 | 16.5 | 19.0 | 20.5 | 23.5 | 14.5 |
| 27 | 6.0 | 0.0 | 0.0 | --- | 1.0 | 6.5 | 9.0 | 18.0 | 16.0 | 19.5 | 24.5 | 14.5 |
| 28 | 4.5 | 0.0 | 0.0 | --- | 0.0 | 8.0 | 9.5 | 19.0 | 14.5 | 19.5 | 24.5 | 14.5 |
| 29 | 5.0 | 0.0 | 1.0 | --- | --- | 8.0 | 10.0 | 16.5 | 14.5 | 19.0 | 22.0 | 15.5 |
| 30 | 5.5 | 0.5 | 1.0 | --- | --- | 8.0 | 11.0 | 13.5 | 14.5 | 20.0 | 20.5 | 15.5 |
| 31 | 5.0 | --- | 1.0 | --- | --- | 5.5 | --- | 11.0 | --- | 20.0 | 22.0 | --- |
| MONTH | 10.0 | 4.0 | 0.5 | --- | --- | 3.5 | 10.0 | 15.0 | 17.0 | 20.0 | 24.0 | 16.0 |
| YEAR | 11.0 | | | | | | | | | | | |

## 06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MONT.

LOCATION.--Lat 45°00'32", long 106°50'08", in NW¼NE¼ sec.33, T.9 S., R.40 E., Big Horn County, at bridge on county road, 1.8 miles east of Decker, and 3.2 miles downstream from gaging station.

DRAINAGE AREA.--1,477 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: October 1965 to September 1971.
Water temperatures: October 1965 to September 1971.

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 1,140 micromhos Aug. 31; minimum daily, 220 micromhos June 18.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED SILICA (SIO2) (MG/L) | TOTAL IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) | DIS-SOLVED CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 21... | 1345 | 280 | 6.0 | 150 | 69 | 47 | 34 | 3.1 | 295 | 0 | 200 | 3.4 |
| DEC. | | | | | | | | | | | | |
| 10... | 0915 | a230 | 8.4 | 120 | 78 | 49 | 34 | 3.8 | 311 | 0 | 200 | 4.6 |
| FEB. | | | | | | | | | | | | |
| 18... | 1215 | a1000 | 8.0 | 160 | 44 | 26 | 19 | 7.4 | 159 | 0 | 120 | 3.2 |
| APR. | | | | | | | | | | | | |
| 21... | 1400 | 428 | 7.2 | 340 | 73 | 48 | 42 | 4.2 | 250 | 6 | 240 | 7.0 |
| JUNE | | | | | | | | | | | | |
| 23... | 0930 | 1400 | 4.9 | 50 | 26 | 12 | 9.2 | 1.8 | 102 | 0 | 47 | 1.3 |
| JULY | | | | | | | | | | | | |
| 07... | 1210 | 428 | 6.0 | 410 | 51 | 28 | 23 | 2.2 | 195 | 3 | 120 | 3.5 |
| 20... | 1430 | 266 | 3.4 | 250 | 67 | 35 | 34 | 3.1 | 230 | 7 | 170 | 2.2 |
| AUG. | | | | | | | | | | | | |
| 13... | 1100 | 90 | 7.8 | 60 | 84 | 63 | 60 | 4.9 | 323 | 0 | 330 | 4.2 |
| 25... | 0900 | 77 | 7.2 | 100 | 91 | 61 | 61 | 6.9 | 331 | 0 | 340 | 5.4 |
| SEP. | | | | | | | | | | | | |
| 01... | 1750 | 143 | 8.2 | 50 | 84 | 68 | 58 | 5.8 | 311 | 0 | 340 | 5.0 |
| 23... | 1430 | 249 | 5.0 | 900 | 73 | 53 | 40 | 3.8 | 301 | 0 | 230 | 3.5 |

a Daily mean discharge

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 833 | 784 | 808 | 849 | 498 | 974 | 979 | 994 | 295 | 434 | 893 | 1060 |
| 2 | 830 | 781 | 863 | 832 | 510 | 977 | 974 | 966 | 272 | 453 | 944 | 1060 |
| 3 | 830 | 781 | 814 | 814 | 778 | 966 | 1030 | 909 | 268 | 456 | 950 | 1130 |
| 4 | 830 | 777 | 815 | 852 | 862 | 966 | 1070 | 809 | 266 | 457 | 959 | 1020 |
| 5 | 827 | 784 | 681 | 786 | 862 | 903 | 1050 | 695 | 265 | 474 | 974 | 1030 |
| 6 | 841 | 797 | 802 | 787 | 866 | 900 | 1090 | 593 | 280 | 543 | 990 | 1000 |
| 7 | 834 | 796 | 800 | 833 | 867 | 900 | 1090 | 507 | 272 | 536 | 1000 | 985 |
| 8 | 828 | 793 | 815 | 836 | 861 | 758 | 1050 | 474 | 270 | 540 | 1030 | 953 |
| 9 | 830 | 804 | 816 | 832 | 861 | 757 | 982 | 453 | 271 | 541 | 1050 | 924 |
| 10 | 818 | 804 | 910 | 798 | 863 | 732 | 923 | 412 | 245 | 562 | 1040 | 937 |
| 11 | 840 | 808 | 908 | 832 | 377 | 680 | 903 | 426 | 263 | 624 | 1020 | 934 |
| 12 | 804 | 806 | 915 | 801 | 366 | 650 | 858 | 431 | 257 | 608 | 1040 | 929 |
| 13 | 800 | 814 | 956 | 798 | 350 | 630 | 849 | 382 | 248 | 650 | 1040 | 937 |
| 14 | 801 | 806 | 953 | 797 | 352 | 627 | 876 | 318 | 231 | 650 | 1020 | 956 |
| 15 | 798 | 805 | 959 | 779 | 359 | 797 | 893 | 293 | 226 | 681 | 1020 | 979 |
| 16 | 820 | 829 | 824 | 824 | 356 | 801 | 878 | 285 | 225 | 689 | 1020 | 982 |
| 17 | 800 | 827 | 825 | 828 | 355 | 804 | 852 | 304 | 222 | 681 | 1020 | 976 |
| 18 | 817 | 816 | 820 | 779 | 486 | 854 | 841 | 314 | 220 | 696 | 1030 | 956 |
| 19 | 800 | 814 | 902 | 748 | 484 | 920 | 816 | 333 | 224 | 690 | 1040 | 942 |
| 20 | 784 | 812 | 899 | 759 | 645 | 894 | 803 | 346 | 223 | 703 | 1040 | 951 |
| 21 | 785 | 814 | 901 | 779 | 785 | 892 | 832 | 363 | 250 | 702 | 1050 | 914 |
| 22 | 794 | 844 | 894 | 752 | 791 | 1030 | 868 | 384 | 250 | 747 | 1090 | 918 |
| 23 | 787 | 1000 | 925 | 784 | 372 | 1040 | 841 | 468 | 262 | 773 | 1070 | 897 |
| 24 | 788 | 1020 | 867 | 752 | 878 | 1030 | 883 | 461 | 287 | 798 | 1100 | 878 |
| 25 | 792 | 780 | 868 | 792 | 885 | 1070 | 894 | 449 | 300 | 786 | 1100 | 883 |
| 26 | 825 | 775 | 892 | 792 | 852 | 903 | 736 | 420 | 287 | 848 | 1080 | 861 |
| 27 | 828 | 771 | 892 | 792 | 848 | 904 | 878 | 382 | 304 | 830 | 1080 | 869 |
| 28 | 828 | 776 | 806 | 790 | 977 | 905 | 980 | 324 | 355 | 827 | 1120 | 858 |
| 29 | 809 | 810 | 829 | 792 | --- | 832 | 1010 | 273 | 353 | 826 | 1130 | 848 |
| 30 | 813 | 812 | 805 | 513 | --- | 893 | 997 | 227 | 384 | 848 | 1060 | 875 |
| 31 | 809 | --- | 803 | 499 | --- | 985 | --- | 299 | --- | 891 | 1140 | --- |
| MONTH | 814 | 815 | 857 | 781 | 655 | 870 | 924 | 461 | 269 | 663 | 1040 | 948 |
| YEAR | 759 | | | | | | | | | | | |

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MONT.--Continued

EXTREMES, 1970-71.--Continued
Water temperatures: Maximum, 25.5°C Aug. 15, 17; minimum, freezing point on many days during November to March.

Period of record:
Specific conductance: Maximum daily, 1,490 micromhos Aug. 12, 1966; minimum daily, 196 micromhos May 30, 1967.
Water temperatures: Maximum, 31.0°C July 16, 1966; minimum, freezing point on many days during winter period.

REMARKS.--During periods of backwater the site of sampling is moved upstream 0.5 mile. Maximum observed during water year: Water temperature, 26.0°C July 20.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (NO3) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) | TEMP-ERATURE (DEG C) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 21... | .3 | .0 | 90 | 511 | .70 | 387 | 360 | 118 | .8 | 777 | 8.2 | 5.0 |
| DEC. | | | | | | | | | | | | |
| 10... | .3 | 1.1 | 140 | 535 | .73 | 335 | 400 | 145 | .7 | 820 | 8.1 | .0 |
| FEB. | | | | | | | | | | | | |
| 18... | .4 | 1.4 | 70 | 313 | .45 | 891 | 220 | 90 | .6 | 475 | -- | .0 |
| APR. | | | | | | | | | | | | |
| 21... | .5 | .2 | 80 | 549 | .75 | 640 | 380 | 165 | .9 | 770 | 8.4 | 7.0 |
| JUNE | | | | | | | | | | | | |
| 23... | .2 | .1 | 50 | 153 | .22 | 605 | 120 | 36 | .4 | 252 | 7.5 | 18.0 |
| JULY | | | | | | | | | | | | |
| 07... | .3 | .1 | 60 | 337 | .47 | 400 | 240 | 75 | .6 | 505 | 8.4 | 20.0 |
| 20... | .4 | .6 | 90 | 439 | .61 | 325 | 310 | 110 | .8 | 686 | 8.4 | 26.0 |
| AUG. | | | | | | | | | | | | |
| 13... | .4 | .7 | 150 | 712 | 1.00 | 178 | 470 | 205 | 1.2 | 1060 | 8.3 | 23.0 |
| 25... | .4 | .6 | 150 | 732 | 1.01 | 154 | 480 | 208 | 1.2 | 1060 | 8.1 | 16.0 |
| SEP. | | | | | | | | | | | | |
| 01... | .5 | .3 | 40 | 726 | 1.04 | 294 | 490 | 235 | 1.1 | 1070 | 8.1 | 24.0 |
| 23... | .3 | .5 | 120 | 559 | .80 | 394 | 400 | 153 | .9 | 837 | 8.2 | 12.5 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.0 | 3.0 | 0.0 | 0.0 | 2.5 | 0.0 | 7.0 | 13.0 | 10.0 | 21.0 | 18.0 | 20.0 |
| 2 | 10.5 | 3.0 | 0.0 | 0.0 | 1.0 | 0.0 | 4.0 | 13.0 | 12.0 | 17.5 | 22.0 | 19.0 |
| 3 | 10.0 | 3.0 | 1.0 | 0.0 | 0.0 | 0.0 | 4.5 | 14.0 | 13.0 | 18.0 | 21.0 | 17.5 |
| 4 | 11.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 15.0 | 13.0 | 17.5 | 20.0 | 16.0 |
| 5 | 11.5 | 2.5 | 0.5 | 0.0 | 0.0 | 0.0 | 7.0 | 14.0 | 13.0 | 18.5 | 21.0 | 15.0 |
| 6 | 11.5 | 4.5 | 1.0 | 0.0 | 0.0 | 0.0 | 8.0 | 13.0 | 12.0 | 18.0 | 24.0 | 17.0 |
| 7 | 10.0 | 6.0 | 2.5 | 0.0 | 0.0 | 0.0 | 7.0 | 12.0 | 15.0 | 17.5 | 22.0 | 16.0 |
| 8 | 7.0 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 12.0 | 15.5 | 21.0 | 24.5 | 15.0 |
| 9 | 6.0 | 5.0 | 0.0 | 0.0 | 0.0 | 2.0 | 7.0 | 12.0 | 16.0 | 19.0 | 21.5 | 15.0 |
| 10 | 6.0 | 6.0 | 0.0 | 0.0 | 0.0 | 2.0 | 10.0 | 11.0 | 16.0 | 19.0 | 20.0 | 16.0 |
| 11 | 6.0 | 5.5 | 0.0 | 0.0 | 1.0 | 3.0 | 8.0 | 11.0 | 17.0 | 20.0 | 21.0 | 16.0 |
| 12 | 6.0 | 6.0 | 0.0 | 0.0 | 2.0 | 1.0 | 8.0 | 11.0 | 14.0 | 25.0 | 21.0 | 17.0 |
| 13 | 5.5 | 5.0 | 0.0 | 0.0 | 3.0 | 3.0 | 7.0 | 15.0 | 15.0 | 23.0 | 22.0 | 16.0 |
| 14 | 5.0 | 4.0 | 0.0 | 0.0 | 3.0 | 2.0 | 10.0 | 11.0 | 16.0 | 20.0 | 23.5 | 14.0 |
| 15 | 5.0 | 3.5 | 0.0 | 0.0 | 3.0 | 1.5 | 10.5 | 16.0 | 15.5 | 19.0 | 25.5 | 12.0 |
| 16 | 6.0 | 4.5 | 0.0 | 0.0 | 4.0 | 0.5 | 9.5 | 17.0 | 16.0 | 19.5 | 25.0 | 11.0 |
| 17 | 5.0 | 4.0 | 0.0 | 0.0 | 4.0 | 1.0 | 10.0 | 9.0 | 15.0 | 20.0 | 25.5 | 10.0 |
| 18 | 5.0 | 3.5 | 0.0 | 0.0 | 3.0 | 0.0 | 10.5 | 11.0 | 16.0 | 25.0 | 20.0 | 10.0 |
| 19 | 5.5 | 4.0 | 0.0 | 0.0 | 2.0 | 3.0 | 9.0 | 8.0 | 16.0 | 19.0 | 20.0 | 10.0 |
| 20 | 5.5 | 2.5 | 0.0 | 0.0 | 1.0 | 2.0 | 7.5 | 8.0 | 16.0 | 19.5 | 20.0 | 11.0 |
| 21 | 5.0 | 1.5 | 0.0 | 0.0 | 1.0 | 1.0 | 8.0 | 10.0 | 18.0 | 22.0 | 20.5 | 10.0 |
| 22 | 5.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 8.0 | 12.0 | 18.0 | 23.0 | 22.0 | 8.0 |
| 23 | 9.0 | 2.0 | 0.0 | 0.0 | 0.0 | 1.0 | 9.0 | 10.0 | 20.0 | 20.0 | 22.0 | 10.0 |
| 24 | 6.5 | 3.0 | 0.0 | 0.0 | 0.0 | 2.0 | 11.0 | 10.0 | 18.0 | 21.0 | 21.0 | 11.0 |
| 25 | 5.5 | 2.0 | 0.0 | 0.0 | 0.0 | 5.0 | 9.0 | 14.0 | 20.0 | 22.0 | 21.0 | 10.0 |
| 26 | 5.0 | 2.0 | 0.0 | 0.0 | 0.0 | 4.0 | 6.5 | 15.0 | 18.0 | 21.0 | 21.5 | 15.0 |
| 27 | 4.0 | 0.0 | 0.0 | 1.0 | 0.0 | 5.0 | 6.0 | 15.5 | 18.0 | 19.0 | 21.0 | 12.0 |
| 28 | 3.0 | 0.0 | 0.0 | 1.0 | 0.0 | 5.0 | 8.0 | 16.0 | 15.0 | 18.0 | 21.0 | 11.0 |
| 29 | 4.0 | 0.0 | 0.0 | 2.0 | --- | 5.0 | 10.0 | 14.5 | 14.0 | 15.0 | 21.5 | 13.0 |
| 30 | 4.0 | 0.0 | 0.0 | 2.0 | --- | 6.0 | 9.5 | 11.5 | 15.0 | 24.0 | 21.0 | 10.0 |
| 31 | 4.5 | --- | 0.0 | 2.0 | --- | 7.0 | --- | 10.0 | --- | 17.5 | 22.0 | --- |
| MONTH | 6.5 | 3.0 | 0.0 | 0.5 | 1.0 | 2.0 | 8.0 | 12.5 | 15.5 | 20.0 | 21.5 | 13.5 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06308500 TONGUE RIVER AT MILES CITY, MONT.
(Irrigation network station)

LOCATION.--Lat 46°21'30", long 105°48'24", in SE¼ sec.23, T.7 N., R.47 E., Custer County, at gaging station 4 miles south of Miles City and 8 miles upstream from mouth.

DRAINAGE AREA.--5,379 sq mi.

PERIOD OF RECORD.--Chemical analyses: September 1948 to September 1971.
Water temperatures: April 1949 to September 1971.
Sediment records: June 1946 to September 1951.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 1140 | 269 | 5.5 | 7.8 | 0 | 64 | 43 | 59 | 5.1 | 272 | 0 | 230 |
| NOV. | | | | | | | | | | | | |
| 05... | 1030 | 272 | 1.0 | 7.9 | 100 | 68 | 47 | 65 | 4.9 | 304 | 0 | 250 |
| DEC. | | | | | | | | | | | | |
| 08... | 1400 | 227 | -- | 7.0 | 30 | 75 | 51 | 74 | 5.7 | 346 | 0 | 280 |
| JAN. | | | | | | | | | | | | |
| 12... | 1540 | 172 | .0 | 6.8 | 140 | 91 | 54 | 72 | 5.4 | 369 | 0 | 280 |
| FEB. | | | | | | | | | | | | |
| 10... | 1300 | 202 | .0 | 6.7 | -- | -- | -- | 59 | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 02... | 1345 | 1070 | .5 | 8.0 | 200 | 65 | 37 | 42 | 6.0 | 255 | 0 | 190 |
| APR. | | | | | | | | | | | | |
| 07... | 1500 | 930 | 10.5 | 8.9 | 40 | 78 | 57 | 94 | 8.2 | 293 | -- | 360 |
| MAY | | | | | | | | | | | | |
| 05... | 0930 | 1040 | 16.5 | 4.0 | 30 | 72 | 51 | 67 | 7.8 | 259 | -- | 300 |
| JUNE | | | | | | | | | | | | |
| 09... | 1120 | 1840 | 19.0 | 8.5 | 80 | 35 | 20 | 33 | 3.0 | 152 | 0 | 110 |
| JULY | | | | | | | | | | | | |
| 08... | 1700 | 300 | 24.0 | 9.6 | 10 | 51 | 31 | 46 | 3.7 | 231 | 0 | 160 |
| AUG. | | | | | | | | | | | | |
| 04... | 1000 | 69 | 22.0 | 8.3 | 20 | 57 | 37 | 79 | 4.5 | 287 | 0 | 230 |
| SEP. | | | | | | | | | | | | |
| 02... | 0915 | 447 | 20.0 | 8.2 | 20 | 53 | 34 | 59 | 4.7 | 238 | 0 | 190 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 832 | 913 | 990 | 1100 | 803 | 730 | 723 | 1010 | 578 | 521 | 862 | 916 |
| 2 | 816 | 902 | 997 | 1100 | 740 | 747 | 767 | 927 | 571 | 511 | 852 | 764 |
| 3 | 818 | 904 | 994 | 1090 | 723 | 747 | 823 | 918 | 525 | 502 | 930 | 760 |
| 4 | 832 | 913 | 987 | 1080 | 676 | 726 | 947 | 918 | 505 | 504 | 922 | 760 |
| 5 | 816 | 913 | 994 | 1090 | 687 | 697 | 1010 | 915 | 468 | 523 | 987 | 819 |
| 6 | 825 | 915 | 1040 | 1130 | 682 | 695 | 1090 | 913 | 472 | 559 | 984 | 826 |
| 7 | 840 | 915 | 1030 | 1130 | 773 | 704 | 1120 | 915 | 482 | 606 | 903 | 822 |
| 8 | 849 | 904 | 1030 | 1090 | 784 | 692 | 1130 | 957 | 487 | 646 | 984 | 798 |
| 9 | 842 | 894 | 931 | 1020 | 795 | 809 | 1160 | 948 | 508 | 671 | 874 | 833 |
| 10 | 857 | 891 | 931 | 1080 | 858 | 586 | 1190 | 942 | 543 | 709 | 887 | 840 |
| 11 | 857 | 891 | 1070 | 1080 | 876 | 508 | 1220 | 939 | 535 | 692 | 877 | 800 |
| 12 | 849 | 891 | 1070 | 1080 | 817 | 442 | 1190 | 936 | 453 | 710 | 887 | 802 |
| 13 | 849 | 913 | 1070 | 1080 | 628 | 423 | 1190 | 936 | 451 | 800 | 895 | 819 |
| 14 | 842 | 891 | 1060 | 1050 | 410 | 493 | 1190 | 936 | 470 | 785 | 895 | 824 |
| 15 | 837 | 918 | 1100 | 1050 | 221 | 608 | 1170 | 915 | 445 | 823 | 903 | 856 |
| 16 | 837 | 915 | 1100 | 987 | 215 | 526 | 1160 | 913 | 456 | 1050 | 903 | 864 |
| 17 | 842 | 915 | 1100 | 1010 | 266 | 540 | 1160 | 915 | 448 | 1050 | 903 | 856 |
| 18 | 862 | 921 | 1130 | 819 | 266 | 650 | 1120 | 907 | 438 | 1050 | 956 | 856 |
| 19 | 849 | 918 | 1190 | 1010 | 290 | 719 | 1140 | 885 | 507 | 1050 | 922 | 866 |
| 20 | 867 | 962 | 1140 | 1010 | 359 | 770 | 1110 | 885 | 432 | 1040 | 913 | 866 |
| 21 | 875 | 918 | 1190 | 1010 | 483 | 734 | 1100 | 813 | 429 | 1040 | 903 | 907 |
| 22 | 875 | 971 | 1220 | 1010 | 602 | 734 | 1170 | 823 | 382 | 1180 | 900 | 907 |
| 23 | 893 | 1080 | 1230 | 1010 | 629 | 823 | 1170 | 694 | 382 | 1190 | 913 | 974 |
| 24 | 902 | 1100 | 1230 | 997 | 709 | 859 | 1120 | 681 | 385 | 1420 | 900 | 944 |
| 25 | 930 | 1120 | 1230 | 997 | 690 | 882 | 1050 | 597 | 436 | 970 | 852 | 965 |
| 26 | 916 | 1110 | 1230 | 997 | 628 | 768 | 1040 | 598 | 436 | 957 | 855 | 953 |
| 27 | 913 | 1050 | 1210 | 980 | 667 | 768 | 1040 | 578 | 490 | 859 | 855 | 965 |
| 28 | 902 | 1040 | 1210 | 980 | 694 | 687 | 1010 | 581 | 487 | 859 | 855 | 965 |
| 29 | 888 | 1040 | 1190 | 653 | --- | 611 | 1010 | 562 | 517 | 859 | 803 | 977 |
| 30 | 891 | 1040 | 1210 | 933 | --- | 608 | 1040 | 584 | 515 | 859 | 805 | 977 |
| 31 | 891 | --- | 1120 | 1010 | --- | 636 | --- | 584 | --- | 882 | 781 | --- |
| MONTH | 861 | 956 | 1100 | 1020 | 606 | 675 | 1080 | 827 | 474 | 835 | 892 | 869 |
| YEAR | 852 | | | | | | | | | | | |

06308500 TONGUE RIVER AT MILES CITY, MONT.--Continued

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 1,420 micromhos July 24; minimum daily, 215 micromhos Feb. 16.
Water temperatures: Maximum, 23.5°C June 24; minimum, freezing point on many days during November to March.

Period of record:
Specific conductance (1951-71): Maximum daily, 2,390 micromhos Sept. 11, 1958; minimum daily, 215 micromhos Feb. 16, 1971.
Water temperatures: Maximum observed, 30.0°C July 20, 1954; minimum, freezing point on many days during winter periods.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 4.8 | .3 | -- | 120 | 552 | .77 | 413 | 340 | 110 | 1.4 | 822 | 7.9 |
| NOV. | | | | | | | | | | | | |
| 05... | 4.6 | .3 | -- | -- | 600 | .85 | 458 | 360 | 110 | 1.5 | 902 | 7.9 |
| DEC. | | | | | | | | | | | | |
| 08... | 6.0 | .3 | -- | 110 | 666 | .95 | 429 | 400 | 110 | 1.6 | 988 | 7.0 |
| JAN. | | | | | | | | | | | | |
| 12... | 4.5 | .3 | .00 | -- | 690 | .94 | 320 | 450 | 147 | 1.5 | 966 | 8.0 |
| FEB. | | | | | | | | | | | | |
| 10... | 4.0 | -- | .00 | -- | -- | -- | -- | -- | -- | -- | 780 | 7.8 |
| MAR. | | | | | | | | | | | | |
| 02... | 4.4 | .5 | .20 | 70 | 470 | .64 | 1360 | 310 | 101 | 1.0 | 725 | 8.6 |
| APR. | | | | | | | | | | | | |
| 07... | 4.4 | .4 | .30 | -- | 756 | 1.03 | 1900 | 430 | 190 | 2.0 | 1140 | 8.2 |
| MAY | | | | | | | | | | | | |
| 05... | 5.0 | .6 | .00 | -- | 635 | .86 | 1780 | 390 | 180 | 1.5 | 922 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 09... | 5.4 | .4 | .97 | 30 | 295 | .40 | 1470 | 170 | 45 | 1.1 | 467 | 7.8 |
| JULY | | | | | | | | | | | | |
| 08... | 2.7 | .5 | .07 | -- | 418 | .57 | 339 | 250 | 65 | 1.3 | 653 | 7.8 |
| AUG. | | | | | | | | | | | | |
| 04... | 3.3 | .7 | .14 | -- | 562 | .76 | 105 | 290 | 59 | 2.0 | 881 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 02... | 2.8 | .4 | .15 | 120 | 470 | .64 | 567 | 270 | 77 | 1.6 | 759 | 7.9 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 13.0 | 13.0 | 18.0 | 17.5 | 19.5 |
| 2 | 12.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 14.0 | 14.0 | 21.0 | 18.0 | 20.0 |
| 3 | 11.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 15.5 | 16.5 | 18.5 | 19.5 | 18.0 |
| 4 | 11.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 15.0 | 18.0 | 19.0 | 20.0 | 15.5 |
| 5 | 12.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 15.5 | 17.0 | 20.0 | 21.0 | 14.0 |
| 6 | 11.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 15.5 | 17.0 | 21.5 | 21.5 | 15.0 |
| 7 | 5.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 15.0 | 16.5 | 19.0 | 22.0 | 17.5 |
| 8 | 4.5 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 16.0 | 16.0 | 17.0 | 22.0 | 15.5 |
| 9 | 5.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 17.0 | 18.0 | 19.0 | 23.0 | 14.0 |
| 10 | 6.5 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.0 | 15.0 | 18.5 | 21.0 | 21.5 | 17.0 |
| 11 | 7.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 13.5 | 20.0 | 20.5 | 19.0 | 17.0 |
| 12 | 7.5 | 2.5 | 0.0 | 0.0 | 0.0 | 1.0 | 8.5 | 14.5 | 20.5 | 20.0 | 20.0 | 15.5 |
| 13 | 6.5 | 1.5 | 0.0 | 0.0 | 0.0 | 1.0 | 8.0 | 15.0 | 20.0 | 19.0 | 21.0 | 15.0 |
| 14 | 5.0 | 1.0 | 0.0 | 0.0 | 0.5 | 1.0 | 9.0 | 17.5 | 21.0 | 18.0 | 21.0 | 13.0 |
| 15 | 5.0 | 2.0 | 0.0 | 0.0 | 1.0 | 1.0 | 10.5 | 15.5 | 21.0 | 17.0 | 21.0 | 12.0 |
| 16 | 4.0 | 3.0 | 0.0 | 0.0 | 0.0 | 1.5 | 10.0 | 16.0 | 20.0 | 19.5 | 20.5 | 10.0 |
| 17 | 4.5 | 3.0 | 0.0 | 0.0 | 0.0 | 1.5 | 10.5 | 14.0 | 20.5 | 21.0 | 21.0 | 9.0 |
| 18 | 6.0 | 4.0 | 0.0 | 0.0 | 0.0 | 1.0 | 10.5 | 12.0 | 20.0 | 20.0 | 20.0 | 7.0 |
| 19 | 5.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.5 | 9.5 | 11.5 | 21.5 | 18.0 | 19.0 | 10.0 |
| 20 | 5.0 | 2.0 | 0.0 | 0.0 | 0.0 | 1.5 | 10.0 | 12.0 | 22.0 | 19.0 | 19.5 | 11.5 |
| 21 | 3.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 | 10.0 | 13.0 | 22.5 | 18.0 | 20.0 | 10.0 |
| 22 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.0 | 14.5 | 22.0 | 19.0 | 21.0 | 9.0 |
| 23 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 14.0 | 23.0 | 19.0 | 20.0 | 10.0 |
| 24 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.0 | 13.0 | 23.5 | 18.0 | 14.5 | 10.5 |
| 25 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 11.0 | 15.0 | 23.0 | 17.0 | 18.5 | 11.0 |
| 26 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 10.0 | 16.5 | 22.5 | 15.0 | 19.0 | 13.0 |
| 27 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 8.0 | 17.0 | 20.0 | 15.5 | 20.0 | 12.0 |
| 28 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 8.5 | 19.0 | 18.0 | 15.0 | 21.0 | 10.5 |
| 29 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 5.0 | 10.0 | 18.5 | 17.5 | 16.0 | 21.0 | 10.0 |
| 30 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 6.0 | 11.5 | 15.0 | 17.5 | 16.0 | 20.0 | 11.0 |
| 31 | 0.5 | --- | 0.0 | 0.0 | --- | 5.5 | --- | 13.5 | --- | 16.5 | 18.0 | --- |
| MONTH | 6.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.5 | 8.5 | 15.0 | 19.5 | 18.5 | 20.0 | 13.0 |
| YEAR | 8.5 | | | | | | | | | | | |

## 06324500 POWDER RIVER AT MOORHEAD, MONT.

LOCATION.--Lat 45°03'21", long 105°52'27", in NW¼NW¼ sec.17, T.9 S., R.48 E., Powder River County, at footbridge at former gaging station site 0.9 mile upstream from discontinued post office at Moorhead, 1 mile upstream from present gage, and at mile 185.8.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 15... | 1000 | 157 | 150 | 73 | -- | 790 | 230 | -- | -- |
| NOV. | | | | | | | | | |
| 17... | 1300 | 254 | 130 | 56 | -- | -- | 170 | -- | .3 |
| DEC. | | | | | | | | | |
| 17... | 1100 | 87 | 160 | 70 | -- | 710 | 100 | -- | .6 |
| JAN. | | | | | | | | | |
| 08... | 1130 | 136 | -- | -- | -- | -- | -- | -- | -- |
| FEB. | | | | | | | | | |
| 18... | 1230 | 1520 | 79 | 25 | 66 | 280 | 36 | .4 | -- |
| MAR. | | | | | | | | | |
| 19... | 1230 | 868 | 110 | 38 | -- | 440 | 10 | -- | -- |
| APR. | | | | | | | | | |
| 01... | 1000 | 842 | 130 | 57 | 190 | 600 | 98 | .7 | -- |
| MAY | | | | | | | | | |
| 06... | 1800 | 636 | 130 | 12 | -- | 690 | 100 | -- | -- |
| JUNE | | | | | | | | | |
| 08... | 1030 | 2000 | 65 | 24 | -- | 360 | 33 | -- | -- |
| JULY | | | | | | | | | |
| 01... | 0900 | 586 | 86 | 37 | -- | 430 | 85 | -- | -- |
| AUG. | | | | | | | | | |
| 03... | 1030 | 46 | 150 | 85 | 200 | 840 | 90 | .4 | -- |
| SEP. | | | | | | | | | |
| 02... | 1530 | 7.7 | 150 | 100 | -- | 1100 | 35 | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 15... | 1000 | 157 | -- | 0 | -- | 1 | 0 | 0 | -- |
| DEC. | | | | | | | | | |
| 17... | 1100 | 87 | -- | -- | -- | -- | -- | -- | .00 |
| FEB. | | | | | | | | | |
| 18... | 1230 | 1520 | 0 | 0 | 100 | 0 | 0 | 12 | .01 |
| APR. | | | | | | | | | |
| 01... | 1000 | 842 | 0 | 0 | 190 | 0 | 0 | 8 | .00 |
| AUG. | | | | | | | | | |
| 03... | 1030 | 46 | 0 | 0 | 260 | 1 | 0 | 30 | .00 |

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 15... | 1000 | 157 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 08... | 1130 | 136 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAY | | | | | | | | | | |
| 06... | 1800 | 636 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| AUG. | | | | | | | | | | |
| 03... | 1030 | 46 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 15... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | |
| 08... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MAY | | | | | | | | | |
| 06... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| AUG. | | | | | | | | | |
| 03... | .00 | .00 | -- | -- | -- | -- | .00 | .00 | .00 |

06324500 POWDER RIVER AT MOORHEAD, MONT.--Continued

DRAINAGE AREA.--8,088 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: February 1951 to September 1953, October 1955 to September 1957, July 1969 to September 1971.
Water temperatures: February 1951 to September 1953, October 1955 to September 1957.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 15... | -- | 1830 | 2.49 | 776 | 660 | -- | -- | 2.5 |
| NOV. | | | | | | | | |
| 17... | -- | 1490 | 2.03 | 1020 | 560 | .08 | .82 | 2.0 |
| DEC. | | | | | | | | |
| 17... | -- | 1490 | 2.03 | 350 | 690 | .10 | .040 | 3.5 |
| JAN. | | | | | | | | |
| 08... | -- | -- | -- | -- | -- | -- | -- | 1.6 |
| FEB. | | | | | | | | |
| 18... | .40 | 584 | .79 | 2400 | -- | .15 | .49 | 8.1 |
| MAR. | | | | | | | | |
| 19... | .20 | 1050 | 1.43 | 2460 | 430 | .61 | .42 | 3.6 |
| APR. | | | | | | | | |
| 01... | .40 | 1240 | 1.69 | 2820 | 560 | .23 | .40 | 3.8 |
| MAY | | | | | | | | |
| 06... | .40 | 1350 | -- | 2320 | 370 | .20 | 1.7 | 2.1 |
| JUNE | | | | | | | | |
| 08... | .63 | 718 | .00 | -- | 260 | .04 | 1.3 | 2.2 |
| JULY | | | | | | | | |
| 01... | .25 | 954 | 1.30 | 1510 | 370 | .26 | .030 | 2.4 |
| AUG. | | | | | | | | |
| 03... | .02 | 1610 | 2.19 | 200 | 720 | .14 | .050 | 1.3 |
| SEP. | | | | | | | | |
| 02... | .01 | 1900 | 2.58 | 39.5 | 790 | .13 | .060 | .7 |

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 15... | 0 | 15 | -- | 0 | 4 | 0 | 0 | 10 |
| DEC. | | | | | | | | |
| 17... | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | | | | | | | | |
| 18... | 8 | 240 | .5 | 2 | 6 | 2 | 1 | 8 |
| APR. | | | | | | | | |
| 01... | 2 | 50 | .2 | 0 | 6 | 10 | 0 | 20 |
| AUG. | | | | | | | | |
| 03... | 4 | 10 | .0 | -- | 0 | -- | 0 | 20 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 15... | 1000 | 2.0 | .5 | 2200 | 11.6 | 7.7 | -- |
| NOV. | | | | | | | |
| 17... | 1300 | 4.5 | 11.0 | 2130 | 10.8 | 8.3 | -- |
| DEC. | | | | | | | |
| 17... | 1100 | .0 | -- | 2250 | 11.8 | 7.8 | -- |
| JAN. | | | | | | | |
| 08... | 1130 | .0 | 2.0 | 2580 | 7.2 | -- | 24 |
| FEB. | | | | | | | |
| 18... | 1230 | .0 | 3.5 | 775 | 6.6 | 7.7 | 140 |
| MAR. | | | | | | | |
| 19... | 1230 | 1.0 | 4.0 | 1700 | 12.0 | -- | 20 |
| APR. | | | | | | | |
| 01... | 1000 | 4.5 | 6.0 | 1650 | 11.0 | 7.8 | 180 |
| MAY | | | | | | | |
| 06... | 1800 | 19.0 | 24.0 | 1900 | 7.8 | 8.3 | 350 |
| JUNE | | | | | | | |
| 08... | 1030 | 16.5 | 22.0 | 950 | 8.0 | 7.5 | 2400 |
| JULY | | | | | | | |
| 01... | 0900 | 17.0 | 26.0 | 1120 | 7.8 | 8.2 | 25 |
| AUG. | | | | | | | |
| 03... | 1030 | 21.5 | 38.5 | 2250 | 8.6 | 8.2 | 55 |
| SEP. | | | | | | | |
| 02... | 1530 | 28.5 | 33.0 | 2050 | 7.6 | 8.5 | 24 |

## 06328500 LOWER YELLOWSTONE PROJECT MAIN CANAL AT INTAKE, MONT.

LOCATION.--Lat 47°16'59", long 104°31'36", in SW¼SE¼SW¼ sec.25, T.18 N., R.56 E., Dawson County, on Bureau of Reclamation Main Canal, 0.2 mile downstream from Intake diversion dam and 0.8 mile southwest of Intake.

PERIOD OF RECORD.--Water temperatures: October 1970 to September 1971 (discontinued).

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | 3.5 | 3.5 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 2 | --- | --- | 3.5 | 3.0 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 3 | --- | --- | 3.0 | 3.0 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 4 | --- | --- | 3.0 | 3.0 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | 3.0 | 3.0 | 2.0 | 1.0 | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | 3.0 | 3.0 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 7 | --- | --- | 3.0 | 3.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 8 | 9.5 | 8.5 | 3.0 | 3.0 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 9 | 8.5 | 7.0 | 3.5 | 3.0 | 1.5 | 0.5 | --- | --- | --- | --- | --- | --- |
| 10 | 7.0 | 7.0 | 3.5 | 3.5 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 11 | 8.0 | 7.0 | 4.0 | 3.5 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 12 | 8.5 | 8.0 | 4.5 | 4.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 13 | 8.5 | 8.5 | 4.5 | 4.5 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 14 | 8.5 | 8.0 | 4.5 | 4.5 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 15 | 8.0 | 7.0 | 4.5 | 4.0 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 16 | 8.0 | 7.0 | 4.0 | 3.5 | 1.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 17 | 8.5 | 8.0 | 4.0 | 4.0 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 18 | 8.5 | 8.5 | 4.0 | 4.0 | 2.0 | 1.0 | --- | --- | --- | --- | --- | --- |
| 19 | 8.5 | 8.5 | 4.0 | 3.0 | 3.5 | 1.5 | --- | --- | --- | --- | --- | --- |
| 20 | 8.5 | 8.5 | 3.0 | 1.5 | 3.5 | 1.0 | --- | --- | --- | --- | --- | --- |
| 21 | 8.5 | 8.5 | 1.5 | 1.0 | 3.0 | 1.0 | --- | --- | --- | --- | --- | --- |
| 22 | 8.5 | 8.5 | 1.5 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 23 | 8.5 | 8.5 | 2.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 24 | 8.5 | 8.5 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 25 | 8.5 | 8.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 26 | 8.0 | 6.5 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | 6.5 | 4.5 | 0.5 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 28 | 4.5 | 3.5 | 0.5 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 29 | 3.5 | 3.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | 3.5 | 3.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | 3.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MONTH | --- | --- | 4.5 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |

## 06328690 LOWER YELLOWSTONE PROJECT MAIN CANAL DRAIN, NEAR CARTWRIGHT, N. DAK.

LOCATION.--Lat 47°52'40", long 103°59'00", near center line between secs. 22 and 27, T.151 N., R.104 W., McKenzie County, on left bank 50 ft downstream from county bridge, 0.4 mile upstream from drain outlet, and 1.2 miles northwest of Cartwright, N. Dak.

PERIOD OF RECORD.--Water temperatures: October 1970 to September 1971 (discontinued).

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 13.5 | 9.5 | 6.0 | 6.0 | --- | --- | --- | --- | --- | --- | 1.5 | 0.0 |
| 2 | 12.0 | 9.5 | 6.0 | 5.5 | --- | --- | --- | --- | --- | --- | 1.0 | 0.0 |
| 3 | 11.5 | 8.0 | 5.5 | 5.5 | --- | --- | --- | --- | --- | --- | 4.0 | 0.0 |
| 4 | 13.0 | 9.0 | 6.0 | 5.0 | --- | --- | --- | --- | --- | --- | 4.5 | 0.0 |
| 5 | 13.0 | 9.5 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | 3.0 | 0.5 |
| 6 | 11.0 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.0 |
| 7 | 8.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 2.0 |
| 8 | 7.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 3.0 |
| 9 | 8.5 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.5 | 1.5 |
| 10 | 7.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 3.0 |
| 11 | 9.5 | 6.5 | --- | --- | --- | --- | --- | --- | 4.0 | 3.0 | 5.0 | 1.0 |
| 12 | 9.5 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 0.5 |
| 13 | 9.0 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | 1.5 | 0.5 |
| 14 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 1.5 | 1.5 |
| 15 | 9.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 1.5 | 1.0 |
| 16 | 9.5 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 2.0 | 1.0 |
| 17 | 9.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 3.5 | 2.0 |
| 18 | 10.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 3.5 | 1.5 |
| 19 | 9.0 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 1.0 |
| 20 | 10.0 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 6.5 | 2.0 |
| 21 | 10.0 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.5 |
| 22 | 9.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.5 |
| 23 | 9.5 | 8.0 | --- | --- | --- | --- | --- | --- | 3.0 | --- | 7.0 | 1.5 |
| 24 | 8.5 | 6.0 | --- | --- | --- | --- | --- | --- | 4.5 | 1.0 | 6.0 | 1.5 |
| 25 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | 3.5 | 1.5 | 5.0 | 2.0 |
| 26 | 7.0 | 5.5 | --- | --- | --- | --- | --- | --- | 1.5 | 0.5 | 3.5 | 1.5 |
| 27 | 6.0 | 5.5 | --- | --- | --- | --- | --- | --- | 2.0 | 0.0 | 2.0 | 0.0 |
| 28 | 5.5 | 5.5 | --- | --- | --- | --- | --- | --- | 0.5 | 0.0 | 3.5 | 0.5 |
| 29 | 5.5 | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.5 | 1.0 |
| 30 | 5.5 | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | 8.0 | 1.5 |
| 31 | 6.5 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 1.5 |
| MONTH | 13.5 | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | 8.0 | 0.0 |

06328500 LOWER YELLOWSTONE PROJECT MAIN CANAL AT INTAKE, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 26.5°C Aug. 8-9; minimum, freezing point on many days during November and December.

REMARKS.--Recorder inoperative Oct. 1-7, Dec. 22 to Feb. 17, May 15-18. No flow Feb. 18 to May 14. Recorder removed Sept. 14-30.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | 13.5 | 13.0 | 17.0 | 16.0 | 21.0 | 20.0 | 20.0 | 19.5 |
| 2 | --- | --- | --- | --- | 13.0 | 12.0 | 19.5 | 17.0 | 21.0 | 20.0 | 20.0 | 19.5 |
| 3 | --- | --- | --- | --- | 14.5 | 12.0 | 20.0 | 19.5 | 22.0 | 20.5 | 19.5 | 17.0 |
| 4 | --- | --- | --- | --- | 15.0 | 14.5 | 20.5 | 20.0 | 23.0 | 21.0 | 17.0 | 15.5 |
| 5 | --- | --- | --- | --- | 16.5 | 15.0 | 21.0 | 20.5 | 24.5 | 23.0 | 15.5 | 14.0 |
| 6 | --- | --- | --- | --- | 17.0 | 16.0 | 22.0 | 21.0 | 25.0 | 24.0 | 16.5 | 14.0 |
| 7 | --- | --- | --- | --- | 16.5 | 16.5 | 21.0 | 20.0 | 26.0 | 24.5 | 16.5 | 16.5 |
| 8 | --- | --- | --- | --- | 16.5 | 16.0 | 20.0 | 19.0 | 26.5 | 25.5 | 16.5 | 15.5 |
| 9 | --- | --- | --- | --- | 18.0 | 16.5 | 20.5 | 19.5 | 26.5 | 26.0 | 16.5 | 15.5 |
| 10 | --- | --- | --- | --- | 19.0 | 18.0 | 21.0 | 20.5 | 26.0 | 25.0 | 17.0 | 16.5 |
| 11 | --- | --- | --- | --- | 20.5 | 19.0 | 21.5 | 20.0 | 25.5 | 24.5 | 18.0 | 16.5 |
| 12 | --- | --- | --- | --- | 20.5 | 19.5 | 21.5 | 20.5 | 25.5 | 24.5 | 18.0 | 16.0 |
| 13 | --- | --- | --- | --- | 20.0 | 19.0 | 21.5 | 20.5 | 25.5 | 24.5 | 16.5 | 15.5 |
| 14 | --- | --- | --- | --- | 19.0 | 18.5 | 21.5 | 21.0 | 25.5 | 24.5 | --- | --- |
| 15 | --- | --- | --- | --- | 19.5 | 18.5 | 22.0 | 21.0 | 24.5 | 23.5 | --- | --- |
| 16 | --- | --- | --- | --- | 20.0 | 19.0 | 23.0 | 21.5 | 25.0 | 24.0 | --- | --- |
| 17 | --- | --- | --- | --- | 20.0 | 19.5 | 23.5 | 22.0 | 25.0 | 24.0 | --- | --- |
| 18 | --- | --- | --- | --- | 20.0 | 19.0 | 23.5 | 22.0 | 24.5 | 23.5 | --- | --- |
| 19 | --- | --- | 11.0 | 10.5 | 20.0 | 19.5 | 23.0 | 21.5 | 24.0 | 23.5 | --- | --- |
| 20 | --- | --- | 11.0 | 10.5 | 20.5 | 19.5 | 23.5 | 22.0 | 24.0 | 23.0 | --- | --- |
| 21 | --- | --- | 11.0 | 10.5 | 20.5 | 19.5 | 24.0 | 23.0 | 24.0 | 23.5 | --- | --- |
| 22 | --- | --- | 11.0 | 11.0 | 21.0 | 20.0 | 24.0 | 23.5 | 24.5 | 23.5 | --- | --- |
| 23 | --- | --- | 11.5 | 11.0 | 21.5 | 20.5 | 24.0 | 23.0 | 24.5 | --- | --- | --- |
| 24 | --- | --- | 13.0 | 11.0 | 21.5 | 21.0 | 24.0 | 23.5 | --- | --- | --- | --- |
| 25 | --- | --- | 14.5 | 13.0 | 22.0 | 21.0 | 23.5 | 22.0 | 21.0 | 20.0 | --- | --- |
| 26 | --- | --- | 16.0 | 14.0 | 22.0 | 20.5 | 22.0 | 21.0 | 22.0 | 20.5 | --- | --- |
| 27 | --- | --- | 18.0 | 15.5 | 20.5 | 19.0 | 21.0 | 20.5 | 23.5 | 21.0 | --- | --- |
| 28 | --- | --- | 18.5 | 17.0 | 19.0 | 17.0 | 20.5 | 19.5 | 24.0 | 23.0 | --- | --- |
| 29 | --- | --- | 18.5 | 17.0 | 18.0 | 16.5 | 19.5 | 18.5 | 23.5 | 22.0 | --- | --- |
| 30 | --- | --- | 17.0 | 14.0 | 17.0 | 16.0 | 20.5 | 19.0 | 22.0 | 19.0 | --- | --- |
| 31 | --- | --- | 14.0 | 13.5 | --- | --- | 20.5 | 20.0 | 19.5 | 18.5 | --- | --- |
| MONTH | --- | --- | --- | --- | 22.0 | 12.0 | 24.0 | 16.0 | 26.5 | 18.5 | --- | --- |
| YEAR | 26.5 | 0.0 | | | | | | | | | | |

06328690 LOWER YELLOWSTONE PROJECT MAIN CANAL DRAIN, NEAR CARTWRIGHT, N. DAK.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 25.0°C Aug. 8; minimum, freezing point on several days during February and March.

REMARKS.--Recorder stopped Nov. 6 to Feb. 10, Feb. 12-22; range in temperature Nov. 24 to Dec. 28, 1.5°C to 5.0°C. Recorder removed Sept. 14-30.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.5 | 1.5 | 14.0 | 5.5 | 18.5 | 11.5 | 22.0 | 15.5 | 20.5 | 14.5 | 19.0 | 17.0 |
| 2 | 6.0 | 2.0 | 14.5 | 5.5 | 19.0 | 13.5 | 23.0 | 17.0 | 20.5 | 15.5 | 19.0 | 15.5 |
| 3 | 5.0 | 3.0 | 15.5 | 7.0 | 20.0 | 14.0 | 21.0 | 18.5 | 21.0 | 15.5 | 17.0 | 16.0 |
| 4 | 6.5 | 3.0 | 16.0 | 6.0 | 19.0 | 15.0 | 21.0 | 16.0 | 22.0 | 16.5 | 16.0 | 14.5 |
| 5 | 8.0 | 2.0 | 16.5 | 7.0 | 19.0 | 15.0 | 21.0 | 16.0 | 24.0 | 18.5 | 14.5 | 13.5 |
| 6 | 10.0 | 2.0 | 15.5 | 8.0 | 17.0 | 14.0 | 24.0 | 16.5 | 24.0 | 19.0 | 15.5 | 13.0 |
| 7 | 10.0 | 2.0 | 16.0 | 7.0 | 16.0 | 14.5 | 20.5 | 16.0 | 24.5 | 19.0 | 15.5 | 14.0 |
| 8 | 10.5 | 4.0 | 17.0 | 6.5 | 16.5 | 13.5 | 22.0 | 15.0 | 25.0 | 20.5 | 15.5 | 11.5 |
| 9 | 12.0 | 3.0 | 15.5 | 8.5 | 18.5 | 14.0 | 23.5 | 15.5 | 23.5 | 19.5 | 16.5 | 11.5 |
| 10 | 12.0 | 4.5 | 15.0 | 6.5 | 21.0 | 15.0 | 22.0 | 17.0 | 21.5 | 17.0 | 17.0 | 13.0 |
| 11 | 9.5 | 3.0 | 16.0 | 6.0 | 22.0 | 16.5 | 23.0 | 18.0 | 22.0 | 17.0 | 18.5 | 13.0 |
| 12 | 11.0 | 3.5 | 18.0 | 7.0 | 23.5 | 16.5 | 20.0 | 16.0 | 21.5 | 18.0 | 16.0 | 11.5 |
| 13 | 13.0 | 4.0 | 19.0 | 8.5 | 24.5 | 18.0 | 21.0 | 14.5 | 22.0 | 18.0 | 14.0 | 11.5 |
| 14 | 14.0 | 4.5 | 16.5 | 9.0 | 23.5 | 19.0 | 21.0 | 16.0 | 23.5 | 18.0 | --- | --- |
| 15 | 13.0 | 6.0 | 15.5 | 6.0 | 21.0 | 18.0 | 23.0 | 15.5 | 24.0 | 18.5 | --- | --- |
| 16 | 13.5 | 6.5 | 17.0 | 7.0 | 23.0 | 16.5 | 24.0 | 16.5 | 21.5 | 19.5 | --- | --- |
| 17 | 8.0 | 5.5 | 13.0 | 6.5 | 21.5 | 17.0 | 23.5 | 18.0 | 21.5 | 18.0 | --- | --- |
| 18 | 7.0 | 6.0 | 13.0 | 6.5 | 20.5 | 16.5 | 20.0 | 17.0 | 22.0 | 18.0 | --- | --- |
| 19 | 8.0 | 6.0 | 16.5 | 8.0 | 21.0 | 17.0 | 21.0 | 16.0 | 21.5 | 17.0 | --- | --- |
| 20 | 7.0 | 6.0 | 16.0 | 8.5 | 24.5 | 17.0 | 23.0 | 15.5 | 23.0 | 17.0 | --- | --- |
| 21 | 7.0 | 6.5 | 13.0 | 10.0 | 23.5 | 19.0 | 23.0 | 17.0 | 23.0 | 18.5 | --- | --- |
| 22 | 13.5 | 5.0 | 10.0 | 9.0 | 24.5 | 18.0 | 21.5 | 17.0 | 22.0 | 17.0 | --- | --- |
| 23 | 15.0 | 6.0 | 15.0 | 8.0 | 23.5 | 18.5 | 21.5 | 16.0 | 19.5 | 17.0 | --- | --- |
| 24 | 9.5 | 6.5 | 18.0 | 10.5 | 24.5 | 19.0 | 21.0 | 17.0 | 19.0 | 15.0 | --- | --- |
| 25 | 8.5 | 5.0 | 19.0 | 11.0 | 24.0 | 18.5 | 17.0 | 14.5 | 20.0 | 15.0 | --- | --- |
| 26 | 8.5 | 4.5 | 19.0 | 12.0 | 23.5 | 20.5 | 18.5 | 14.0 | 20.5 | 16.0 | --- | --- |
| 27 | 7.0 | 4.5 | 20.0 | 13.0 | 21.0 | 18.5 | 19.0 | 15.5 | 22.0 | 17.0 | --- | --- |
| 28 | 11.5 | 4.0 | 20.0 | 14.0 | 18.0 | 16.5 | 16.5 | 13.0 | 21.5 | 18.0 | --- | --- |
| 29 | 13.0 | 5.0 | 17.0 | 13.5 | 20.5 | 16.5 | 19.0 | 14.0 | 20.0 | 18.0 | --- | --- |
| 30 | 11.5 | 5.5 | 14.5 | 11.0 | 20.5 | 15.0 | 19.5 | 14.0 | 18.5 | 16.0 | --- | --- |
| 31 | --- | --- | 13.0 | 11.0 | --- | --- | 20.0 | 15.0 | 19.5 | 16.0 | --- | --- |
| MONTH | 15.0 | 1.5 | 20.0 | 5.5 | 24.5 | 11.5 | 24.0 | 13.0 | 25.0 | 14.5 | --- | --- |
| YEAR | 25.0 | 0.0 | | | | | | | | | | |

## 06329400 SEARS CREEK NEAR CRANE, MONT.

LOCATION.--Lat 47°32'51", long 104°16'13", in SW¼NW¼SW¼ sec.27, T.21 N., R.58 E., Richland County, 0.5 mile upstream from mouth and 2.2 miles southwest of Crane.

DRAINAGE AREA.--26.9 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1970 to September 1971 (discontinued).

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 14.0 | 10.0 | 3.5 | 3.5 | 2.0 | 0.5 | 2.0 | 1.5 | 0.0 | 0.0 | --- | --- |
| 2 | 12.0 | 10.0 | 3.5 | 3.5 | 0.5 | 0.0 | 1.5 | 0.5 | 0.5 | 0.0 | --- | --- |
| 3 | 11.0 | 6.5 | 3.5 | 3.5 | 0.0 | 0.0 | 0.5 | 0.0 | 0.5 | 0.0 | 3.5 | 0.0 |
| 4 | 13.0 | 8.5 | 6.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 1.0 |
| 5 | 13.0 | 8.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| 6 | 13.0 | 6.0 | 4.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 0.0 |
| 7 | 6.0 | 5.5 | 5.0 | 3.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| 8 | 5.5 | 5.0 | 5.5 | 3.5 | 4.0 | 2.0 | 0.5 | 0.0 | --- | --- | 3.5 | 0.0 |
| 9 | 6.5 | 3.5 | 5.0 | 2.0 | 3.5 | 0.0 | 0.5 | 0.0 | --- | --- | 5.0 | 0.0 |
| 10 | 6.0 | 4.5 | 4.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.5 | 3.0 |
| 11 | 9.0 | 4.5 | 4.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.5 | 2.0 |
| 12 | 9.0 | 7.0 | 4.5 | 4.0 | 1.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.0 | 1.0 |
| 13 | 8.5 | 6.5 | 4.5 | 3.5 | 1.0 | 0.0 | 0.0 | 0.0 | --- | --- | 4.0 | 3.0 |
| 14 | 8.0 | 5.5 | 4.5 | 3.5 | 0.5 | 0.0 | 0.0 | 0.0 | --- | --- | 4.0 | 3.0 |
| 15 | 8.0 | 3.5 | 4.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 4.0 | 3.0 |
| 16 | 8.5 | 3.5 | 5.0 | 3.0 | 0.0 | 0.0 | 0.5 | 0.0 | --- | --- | 6.0 | 3.5 |
| 17 | 8.5 | 3.5 | 5.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.5 | 3.5 |
| 18 | 9.0 | 3.5 | 4.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.0 | 4.0 |
| 19 | 8.0 | 4.5 | 2.0 | 0.5 | 0.0 | 0.0 | 1.0 | 0.0 | --- | --- | 7.0 | 1.0 |
| 20 | 9.0 | 5.5 | 0.5 | 0.0 | 0.0 | 0.0 | 3.0 | 1.0 | --- | --- | 9.5 | 2.0 |
| 21 | 9.0 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 2.0 | --- | --- | --- | --- |
| 22 | 7.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | --- | --- | --- | --- |
| 23 | 8.5 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | --- | --- | 5.5 | 0.0 |
| 24 | 6.5 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.5 | 1.5 |
| 25 | 6.5 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 6.0 | 3.0 |
| 26 | 5.5 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 4.5 | 0.5 |
| 27 | 3.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | --- | --- | 9.0 | 3.5 |
| 28 | 3.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.0 | --- | --- | 9.0 | 1.5 |
| 29 | 3.5 | 2.0 | 1.5 | 0.0 | 0.5 | 0.0 | 3.5 | 0.5 | --- | --- | 10.5 | 3.0 |
| 30 | 4.0 | 2.0 | 2.0 | 1.5 | 1.0 | 0.5 | 0.5 | 0.0 | --- | --- | 10.0 | 5.0 |
| 31 | 4.0 | 2.0 | --- | --- | 2.0 | 1.0 | 0.0 | 0.0 | --- | --- | 8.5 | 2.0 |
| MONTH | 14.0 | 1.5 | 6.0 | 0.0 | 4.0 | 0.0 | 3.5 | 0.0 | --- | --- | 10.5 | 0.0 |

## 06329500 YELLOWSTONE RIVER NEAR SIDNEY, MONT.
(Irrigation network and International Hydrological Decade Station)

LOCATION.--Lat 47°40'42", long 104°09'22", in SW¼NE¼SW¼ sec.9, T.22 N., R.59 E., Richland County, at gaging station at Montana-Dakota Utilities Company powerplant, 0.2 mile downstream from bridge on State Highway 23, 2.5 miles south of Sidney, 3 miles downstream from Fox Creek, and 30 miles upstream from mouth.

DRAINAGE AREA.--69,103 sq mi.

PERIOD OF RECORD.--Chemical analyses: September 1948 to September 1971.
Water temperatures: January 1951 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DISCHARGE (CFS) | TEMPERATURE (DEG C) | SILICA (SIO2) (MG/L) | DISSOLVED IRON (FE) (UG/L) | DISSOLVED CALCIUM (CA) (MG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | POTASSIUM (K) (MG/L) | BICARBONATE (HCO3) (MG/L) | CARBONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1030 | 8390 | 8.0 | 8.6 | 90 | 57 | 24 | 68 | 4.0 | 196 | 0 | 210 |
| NOV. | | | | | | | | | | | | |
| 25... | 1030 | 7600 | .0 | 9.1 | 40 | 65 | 23 | 75 | 4.3 | 219 | 0 | 230 |
| DEC. | | | | | | | | | | | | |
| 22... | 1030 | 7400 | .5 | 13 | 60 | 63 | 27 | 75 | 4.8 | 233 | 0 | 240 |
| JAN. | | | | | | | | | | | | |
| 20... | 1000 | 6000 | 1.5 | 13 | 110 | 74 | 30 | 79 | 4.4 | 239 | 0 | 190 |
| FEB. | | | | | | | | | | | | |
| 23... | 1000 | 16000 | 2.5 | 7.0 | 240 | 41 | 14 | 39 | 5.4 | 126 | 0 | 100 |
| MAR. | | | | | | | | | | | | |
| 23... | 1300 | 16600 | 3.0 | 8.9 | 40 | 57 | 25 | 65 | 4.6 | 190 | -- | 230 |
| APR. | | | | | | | | | | | | |
| 22... | 0800 | 11800 | 8.5 | 11 | 20 | 70 | 30 | 97 | 6.4 | 221 | -- | 280 |
| MAY | | | | | | | | | | | | |
| 22... | 0900 | 24700 | 12.0 | 13 | 40 | 46 | 16 | 44 | 2.7 | 147 | -- | 130 |
| JUNE | | | | | | | | | | | | |
| 22... | 1700 | 53800 | 21.0 | 12 | 50 | 27 | 9.1 | 24 | 2.1 | 104 | 0 | 77 |
| JULY | | | | | | | | | | | | |
| 21... | 1500 | 23600 | 23.5 | 11 | 20 | 28 | 10 | 27 | 2.1 | 109 | 0 | 81 |
| AUG. | | | | | | | | | | | | |
| 25... | 1430 | 6610 | 21.5 | 11 | 10 | 40 | 16 | 48 | 3.3 | 177 | 0 | 120 |
| SEP. | | | | | | | | | | | | |
| 22... | 0930 | 9410 | 10.5 | 10 | 20 | 41 | 16 | 46 | 2.9 | 176 | 0 | 120 |

06329400 SEARS CREEK NEAR CRANE, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 27.0°C Aug. 8; minimum, freezing point on many days during November to April.

REMARKS.--Recorder inoperative Feb. 8 to Mar. 21. Recorder stopped Apr. 22-26, May 11-17, May 19 to June 21; range in temperature, 5.0°C to 10.0°C, 8.0°C to 25.0°C and 8.5°C to 25.0°C, respectively. Recorder removed Sept. 14-30.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.5 | 0.0 | 16.5 | 8.5 | --- | --- | 22.0 | 14.5 | 22.0 | 14.5 | 21.0 | 18.5 |
| 2 | 6.0 | 0.0 | 18.0 | 9.0 | --- | --- | 23.5 | 16.5 | 23.0 | 15.5 | 21.0 | 16.0 |
| 3 | 5.5 | 4.0 | 16.5 | 11.0 | --- | --- | 21.5 | 19.0 | 23.5 | 16.5 | 19.5 | 16.5 |
| 4 | 7.0 | 3.5 | 19.5 | 9.0 | --- | --- | 21.5 | 16.5 | 24.5 | 18.0 | 17.0 | 15.0 |
| 5 | 10.5 | 0.5 | 20.0 | 11.0 | --- | --- | 23.5 | 16.5 | 25.5 | 19.5 | 15.0 | 14.5 |
| 6 | 13.0 | 3.0 | 21.0 | 11.5 | --- | --- | 25.0 | 18.5 | 26.0 | 20.5 | 18.5 | 11.5 |
| 7 | 12.0 | 4.5 | 20.5 | 12.0 | --- | --- | 21.5 | 16.5 | 26.5 | 20.0 | 17.0 | 14.5 |
| 8 | 12.0 | 6.5 | 21.5 | 10.5 | --- | --- | 23.0 | 14.5 | 27.0 | 21.0 | 18.5 | 12.0 |
| 9 | 13.5 | 4.0 | 19.5 | 14.0 | --- | --- | 24.5 | 16.0 | 25.5 | 22.0 | 20.0 | 13.5 |
| 10 | 14.5 | 6.5 | 19.0 | 9.5 | --- | --- | 24.0 | 19.0 | 24.5 | 20.0 | 20.0 | 14.5 |
| 11 | 11.5 | 5.0 | --- | --- | --- | --- | 24.0 | 19.5 | 24.0 | 18.5 | 21.0 | 14.0 |
| 12 | 12.0 | 4.5 | --- | --- | --- | --- | 21.5 | 18.5 | 24.5 | 18.5 | 18.0 | 13.5 |
| 13 | 13.5 | 5.5 | --- | --- | --- | --- | 22.0 | 14.5 | 24.5 | 19.0 | 17.0 | 14.0 |
| 14 | 14.5 | 6.5 | --- | --- | --- | --- | 23.0 | 16.5 | 25.5 | 19.0 | --- | --- |
| 15 | 14.0 | 8.0 | --- | --- | --- | --- | 24.5 | 16.0 | 25.5 | 20.5 | --- | --- |
| 16 | 14.0 | 8.5 | --- | --- | --- | --- | 25.5 | 17.0 | 24.5 | 20.5 | --- | --- |
| 17 | 9.0 | 6.0 | --- | --- | --- | --- | 24.0 | 19.0 | 23.5 | 19.0 | --- | --- |
| 18 | 8.0 | 7.0 | 13.5 | --- | --- | --- | 22.0 | 18.5 | 23.0 | 18.5 | --- | --- |
| 19 | 8.5 | 6.5 | --- | --- | --- | --- | 23.5 | 18.5 | 23.0 | 17.0 | --- | --- |
| 20 | 8.0 | 7.0 | --- | --- | --- | --- | 25.5 | 17.0 | 23.5 | 17.0 | --- | --- |
| 21 | 8.0 | 7.0 | --- | --- | --- | --- | 24.0 | 18.5 | 24.0 | 19.0 | --- | --- |
| 22 | --- | --- | --- | --- | 25.0 | 19.0 | 24.0 | 19.0 | 25.0 | 18.5 | --- | --- |
| 23 | --- | --- | --- | --- | 24.5 | 19.5 | 24.0 | 18.0 | 23.5 | 19.0 | --- | --- |
| 24 | --- | --- | --- | --- | 24.5 | 20.0 | 23.0 | 18.5 | 21.0 | --- | --- | --- |
| 25 | --- | --- | --- | --- | 25.0 | 19.5 | 20.5 | 17.0 | 22.0 | 14.5 | --- | --- |
| 26 | --- | --- | --- | --- | 23.5 | 20.0 | 20.5 | 15.5 | 23.0 | 16.0 | --- | --- |
| 27 | 8.0 | --- | --- | --- | 21.5 | 18.0 | 19.5 | 16.0 | 24.0 | 18.0 | --- | --- |
| 28 | 13.5 | 3.5 | --- | --- | 18.0 | 15.0 | 18.5 | 13.5 | 24.0 | 18.5 | --- | --- |
| 29 | 14.5 | 8.0 | --- | --- | 20.5 | 16.0 | 20.5 | 13.5 | 24.0 | 20.0 | --- | --- |
| 30 | 14.0 | 8.0 | --- | --- | 20.5 | 14.5 | 21.5 | 13.5 | 21.0 | 18.5 | --- | --- |
| 31 | --- | --- | --- | --- | --- | --- | 21.0 | 15.0 | 21.5 | 18.0 | --- | --- |
| MONTH | 14.5 | 0.0 | --- | --- | --- | --- | 25.5 | 13.5 | 27.0 | 14.5 | --- | --- |
| YEAR | 27.0 | 0.0 | | | | | | | | | | |

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MONT.--Continued

EXTREMES.--1970-71:
Specific conductance: Maximum daily, 971 micromhos Apr. 13; minimum daily, 281 micromhos June 29.
Water temperatures: Maximum, 25.0°C Aug. 9; minimum, freezing point on many days during November to February.

Period of record:
Specific conductance: Maximum daily, 2,780 micromhos Jan. 14, 1951; minimum daily, 193 micromhos Aug. 15, 1964.
Water temperatures: Maximum observed, 29.0°C July 23, 1960; minimum, freezing point on many days during winter periods.

REMARKS.--Prior to July 1969, at site, 0.2 mile upstream.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED BORON (B) (UG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 11 | .5 | -- | 30 | 470 | .66 | 10900 | 240 | 71 | 1.9 | 708 | -- |
| NOV. | | | | | | | | | | | | |
| 25... | 13 | .6 | -- | 180 | 528 | .74 | 11100 | 250 | 77 | 2.0 | 779 | 8.2 |
| DEC. | | | | | | | | | | | | |
| 22... | 14 | .5 | -- | 170 | 572 | .77 | 11300 | 270 | 110 | 1.9 | 831 | -- |
| JAN. | | | | | | | | | | | | |
| 20... | 14 | .6 | .20 | 210 | 590 | .84 | 9950 | 310 | 100 | 2.0 | 899 | 7.9 |
| FEB. | | | | | | | | | | | | |
| 23... | 6.6 | .5 | .10 | -- | 280 | .39 | 12500 | 160 | 37 | 1.4 | 460 | 7.4 |
| MAR. | | | | | | | | | | | | |
| 23... | 11 | .6 | .40 | -- | 498 | .70 | 22900 | 250 | 89 | 1.8 | 713 | 7.8 |
| APR. | | | | | | | | | | | | |
| 22... | 15 | .3 | .20 | 140 | 620 | .84 | 19500 | 300 | 120 | 2.4 | 922 | 8.2 |
| MAY | | | | | | | | | | | | |
| 22... | 9.1 | .3 | .30 | 0 | 335 | .46 | 22500 | 180 | 60 | 1.4 | 539 | 7.7 |
| JUNE | | | | | | | | | | | | |
| 22... | 4.3 | .2 | .31 | 100 | 208 | .30 | 32500 | 100 | 20 | 1.0 | 327 | 7.8 |
| JULY | | | | | | | | | | | | |
| 21... | 4.5 | .5 | .12 | 80 | 219 | .32 | 15000 | 110 | 22 | 1.1 | 357 | 8.1 |
| AUG. | | | | | | | | | | | | |
| 25... | 6.2 | .6 | .02 | 170 | 333 | .45 | 5890 | 170 | 21 | 1.6 | 514 | 8.0 |
| SEP. | | | | | | | | | | | | |
| 22... | 6.0 | .8 | .05 | 170 | 330 | .44 | 8180 | 170 | 24 | 1.5 | 535 | 8.2 |

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | BIO-CHEM-ICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. 22... | 1030 | 8390 | 483 | .02 | -- | .050 | 1.0 |
| NOV. 25... | 1030 | 7600 | 541 | .02 | -- | .050 | 1.6 |
| DEC. 22... | 1030 | 7400 | 567 | .17 | -- | .010 | .7 |
| JAN. 20... | 1000 | 6000 | 614 | .06 | .00 | -- | .8 |
| FEB. 23... | 1000 | 16000 | 290 | .06 | .10 | -- | 5.3 |
| MAR. 23... | 1300 | 16600 | 512 | .07 | .09 | .60 | 3.2 |
| APR. 22... | 0800 | 11800 | 612 | .08 | .06 | .30 | 1.2 |
| MAY 22... | 0900 | 24700 | 338 | .11 | .12 | .50 | 1.6 |
| JUNE 22... | 1700 | 53800 | 224 | .00 | .09 | .30 | 1.0 |
| JULY 21... | 1500 | 23600 | 236 | .06 | .09 | .25 | .7 |
| AUG. 25... | 1430 | 6610 | 330 | .06 | .03 | .10 | 1.6 |
| SEP. 22... | 0930 | 9410 | 322 | .03 | .03 | .080 | 2.1 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 594 | 762 | 830 | 876 | 702 | 730 | 680 | 836 | 502 | 318 | 403 | 556 |
| 2 | 596 | 760 | 823 | 855 | 702 | 749 | 653 | 848 | 441 | 314 | 410 | 558 |
| 3 | 594 | 758 | 782 | 850 | 697 | 764 | 710 | 858 | 512 | 344 | 411 | 576 |
| 4 | 596 | 760 | 780 | 824 | 692 | 753 | 783 | 858 | 609 | 360 | 414 | 568 |
| 5 | 607 | 758 | 764 | 810 | 697 | 768 | 808 | 860 | 566 | 384 | 425 | 554 |
| 6 | 609 | 760 | 764 | 801 | 703 | 791 | 833 | 848 | 600 | 362 | 431 | 601 |
| 7 | 608 | 760 | 762 | 795 | 698 | 811 | 854 | 836 | 583 | 344 | 444 | 575 |
| 8 | 631 | 760 | 764 | 786 | 685 | 811 | 877 | 782 | 623 | 311 | 431 | 531 |
| 9 | 662 | 777 | 764 | 799 | 672 | 813 | 903 | 731 | 520 | 314 | 441 | 574 |
| 10 | 673 | 777 | 766 | 806 | 663 | 813 | 940 | 702 | 479 | 329 | 444 | 515 |
| 11 | 679 | 781 | 766 | 824 | 669 | 787 | 949 | 855 | 473 | 391 | 446 | 510 |
| 12 | 691 | 781 | 764 | 833 | 672 | 768 | 968 | 825 | 471 | 379 | 444 | 504 |
| 13 | 704 | 781 | 774 | 850 | 697 | 692 | 971 | 732 | 428 | 340 | 447 | 492 |
| 14 | 704 | 781 | 749 | 850 | 683 | 585 | 958 | 666 | 416 | 351 | 446 | 490 |
| 15 | 704 | 770 | 764 | 855 | 697 | 536 | 940 | 640 | 411 | 341 | 454 | 490 |
| 16 | 699 | 779 | 774 | 876 | 644 | 542 | 931 | 603 | 395 | 333 | 459 | 485 |
| 17 | 707 | 790 | 786 | 881 | 467 | 602 | 901 | 579 | 368 | 333 | 467 | 490 |
| 18 | 715 | 802 | 810 | 901 | 394 | 650 | 903 | 548 | 377 | 345 | 474 | 493 |
| 19 | 720 | 790 | 830 | 906 | 388 | 650 | 931 | 526 | 380 | 353 | 483 | 507 |
| 20 | 722 | 790 | 828 | 901 | 393 | 695 | 931 | 533 | 355 | 322 | 483 | 507 |
| 21 | 724 | 781 | 825 | 890 | 416 | 730 | 906 | 533 | 347 | 371 | 497 | 500 |
| 22 | 724 | 800 | 832 | 884 | 441 | 730 | 903 | 528 | 330 | 355 | 492 | 513 |
| 23 | 722 | 844 | 839 | 876 | 470 | 768 | 929 | 563 | 323 | 344 | 506 | 522 |
| 24 | 724 | 844 | 856 | 873 | 510 | 764 | 903 | 621 | 323 | 348 | 516 | 517 |
| 25 | 724 | 804 | 874 | 841 | 564 | 813 | 968 | 638 | 334 | 353 | 531 | 525 |
| 26 | 756 | 798 | 864 | 765 | 605 | 859 | 929 | 634 | 297 | 355 | 541 | 522 |
| 27 | 760 | 790 | 879 | 725 | 667 | 856 | 912 | 634 | 303 | 358 | 533 | 528 |
| 28 | 762 | 800 | 900 | 699 | 700 | 834 | 920 | 662 | 286 | 366 | 531 | 545 |
| 29 | 673 | 800 | 946 | 676 | --- | 730 | 934 | 672 | 281 | 372 | 543 | 565 |
| 30 | 709 | 819 | 934 | 674 | --- | 732 | 874 | 654 | 297 | 372 | 553 | 578 |
| 31 | 760 | --- | 906 | 689 | --- | 695 | --- | 596 | --- | 376 | 553 | --- |
| MONTH | 686 | 785 | 816 | 822 | 607 | 736 | 887 | 690 | 421 | 350 | 473 | 530 |
| YEAR | 650 | | | | | | | | | | | |

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 22... | 1030 | 8.0 | 3.5 | 690 | 9.4 | 8.7 | 3 |
| NOV. | | | | | | | |
| 25... | 1030 | .0 | -5.0 | 790 | 12.0 | 8.4 | 2 |
| DEC. | | | | | | | |
| 22... | 1030 | .5 | -15.0 | 860 | 12.2 | 8.4 | 4 |
| JAN. | | | | | | | |
| 20... | 1000 | 1.5 | -1.0 | 850 | 11.0 | 8.1 | 6 |
| FEB. | | | | | | | |
| 23... | 1000 | 2.5 | -5.0 | 460 | 11.0 | 8.0 | 47 |
| MAR. | | | | | | | |
| 23... | 1300 | 3.0 | -1.0 | 725 | 11.6 | 7.9 | 20 |
| APR. | | | | | | | |
| 22... | 0800 | 8.5 | 7.0 | 890 | 9.8 | 8.5 | 13 |
| MAY | | | | | | | |
| 22... | 0900 | 12.0 | 9.0 | 545 | 9.4 | 8.3 | 95 |
| JUNE | | | | | | | |
| 22... | 1700 | 21.0 | 30.5 | 330 | 8.0 | 8.2 | 160 |
| JULY | | | | | | | |
| 21... | 1500 | 23.5 | 29.0 | 365 | 8.0 | 8.5 | 14 |
| AUG. | | | | | | | |
| 25... | 1430 | 21.5 | 31.0 | 640 | 8.2 | 8.9 | 26 |
| SEP. | | | | | | | |
| 22... | 0930 | 10.5 | 7.5 | 540 | 10.6 | 8.7 | 45 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14.0 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 4.0 | 10.0 | 13.0 | 16.0 | 19.0 | 20.0 |
| 2 | 13.5 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 3.5 | 10.0 | 13.5 | 17.0 | 19.5 | 20.0 |
| 3 | 12.0 | 2.5 | 0.0 | 0.0 | 0.0 | --- | 4.0 | 12.0 | 13.5 | 19.0 | 20.0 | 19.5 |
| 4 | 12.5 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 4.5 | 13.0 | 15.0 | 18.5 | 20.0 | 18.0 |
| 5 | 13.0 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 4.5 | 14.0 | 15.5 | 19.0 | 22.0 | 16.0 |
| 6 | 13.0 | 2.5 | 0.0 | 0.0 | 0.0 | --- | 5.5 | 15.0 | 16.0 | 20.0 | 23.0 | 15.0 |
| 7 | 9.0 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 7.0 | 14.5 | 16.0 | 20.0 | 23.5 | 17.0 |
| 8 | 7.5 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 8.0 | 14.5 | 15.5 | 18.0 | 24.5 | 17.0 |
| 9 | 6.0 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 8.5 | 15.5 | 16.5 | 19.5 | 25.0 | 17.0 |
| 10 | 5.5 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 10.0 | 14.5 | 18.0 | 20.0 | 24.0 | 18.0 |
| 11 | 5.5 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 10.0 | 14.0 | 19.0 | 21.5 | 23.0 | 18.0 |
| 12 | 8.0 | 4.0 | 0.0 | 0.0 | 0.0 | --- | 9.0 | 14.5 | 20.0 | 20.5 | 23.0 | 18.0 |
| 13 | 7.0 | 4.0 | 0.0 | 0.0 | 0.0 | --- | 9.0 | 15.5 | 20.0 | 19.0 | 23.0 | 17.5 |
| 14 | 7.0 | 4.0 | 0.0 | 0.0 | 0.0 | --- | 10.0 | 16.5 | 19.0 | 20.0 | 23.5 | 15.5 |
| 15 | 6.0 | 3.5 | 0.0 | 0.0 | --- | --- | 10.5 | 15.0 | 18.5 | 20.0 | 23.5 | 14.0 |
| 16 | 6.0 | 3.5 | 0.0 | 0.0 | --- | --- | 10.5 | 15.5 | 19.0 | 21.0 | 24.0 | 13.0 |
| 17 | 6.5 | 4.5 | 0.0 | 0.0 | --- | --- | 10.0 | 14.0 | 19.0 | 22.5 | 24.0 | 12.0 |
| 18 | 7.0 | 4.0 | 0.0 | 0.0 | --- | --- | 10.0 | 11.0 | 18.0 | 21.5 | 23.0 | 11.0 |
| 19 | 7.5 | 3.0 | 0.0 | 0.0 | --- | --- | 9.5 | 11.5 | 19.0 | 21.0 | 22.5 | 12.0 |
| 20 | 7.5 | 2.0 | 0.0 | 0.0 | --- | --- | 9.5 | 11.5 | 19.0 | 20.5 | 22.5 | 12.0 |
| 21 | 8.0 | 1.5 | 0.0 | 0.0 | --- | --- | 9.0 | 12.0 | 19.5 | 21.0 | 23.0 | 11.0 |
| 22 | 7.0 | 0.0 | 0.0 | 0.0 | --- | --- | 9.0 | 12.0 | 20.0 | 22.5 | 22.5 | 11.0 |
| 23 | 8.0 | 0.0 | 0.0 | 0.0 | --- | --- | 9.0 | 11.5 | 20.5 | 22.0 | 23.0 | 11.0 |
| 24 | 7.5 | 0.0 | 0.0 | 0.0 | --- | --- | 10.5 | 12.5 | 20.5 | 22.5 | 20.0 | 12.0 |
| 25 | 7.5 | 0.0 | 0.0 | 0.0 | --- | 1.5 | 10.0 | 13.5 | 20.5 | 21.0 | 20.0 | 13.0 |
| 26 | 5.0 | 0.0 | 0.0 | 0.0 | --- | 1.5 | 8.5 | 14.0 | 21.0 | 20.0 | 20.0 | 14.0 |
| 27 | 5.0 | 0.0 | 0.0 | 0.0 | --- | 2.5 | 8.0 | 15.0 | 20.0 | 20.0 | 21.0 | 12.5 |
| 28 | 4.0 | 0.0 | 0.0 | 0.0 | --- | 3.0 | 7.5 | 17.0 | 17.5 | 19.0 | 22.0 | 12.5 |
| 29 | 2.0 | 0.0 | 0.0 | 0.0 | --- | 3.5 | 9.0 | 17.5 | 16.5 | 18.0 | 23.0 | 12.5 |
| 30 | 3.0 | 0.0 | 0.0 | 0.0 | --- | 5.0 | 9.5 | 16.5 | 16.0 | 18.0 | 21.0 | 13.0 |
| 31 | 2.5 | --- | 0.0 | 0.0 | --- | 5.0 | --- | 13.5 | --- | 19.5 | 19.0 | --- |
| MONTH | 7.5 | 2.0 | 0.0 | 0.0 | --- | --- | 8.5 | 14.0 | 18.0 | 20.0 | 22.0 | 15.0 |
| YEAR | 10.0 | | | | | | | | | | | |

## KOOTENAI RIVER BASIN

### 12301300 TOBACCO RIVER NEAR EUREKA, MONT.

LOCATION.--Lat 48°53'37", long 115°05'13", in NW¼SE¼SE¼ sec.9, T.36 N., R.27 W., Lincoln County, at gaging station 0.2 mile upstream from Indian Creek, 1.8 miles northwest of Eureka and 6.0 miles upstream from mouth.

DRAINAGE AREA.--440 sq mi.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | SILICA (SIO2) (MG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1815 | 73 | 12 | 42 | 3.9 | .8 | 6.4 | 1.0 | .1 | 10 | 182 | .25 |
| JAN. | | | | | | | | | | | | |
| 18... | 1400 | 96 | 7.8 | 42 | 4.0 | .6 | 5.2 | 1.3 | .1 | 10 | 180 | .24 |
| APR. | | | | | | | | | | | | |
| 14... | 1230 | 297 | 11 | 37 | 2.7 | .9 | 7.5 | .5 | .2 | 20 | 152 | .21 |
| MAY | | | | | | | | | | | | |
| 20... | 0930 | 890 | 9.3 | 25 | 1.5 | .5 | 2.5 | .8 | .1 | 0 | 98 | .13 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1815 | 73 | 100 | 0 | 0 | 0 | 1 | -- | 0 | 0 | 0 | 20 |
| JAN. | | | | | | | | | | | | |
| 18... | 1400 | 96 | 200 | 0 | 0 | 10 | 0 | -- | 1 | 0 | 1 | 140 |
| APR. | | | | | | | | | | | | |
| 14... | 1230 | 297 | 300 | 0 | 300 | 0 | 0 | -- | 0 | 0 | 2 | 40 |
| MAY | | | | | | | | | | | | |
| 20... | 0930 | 890 | 500 | -- | 100 | 0 | 1 | 0 | 0 | 0 | 0 | 50 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | ALKA-LINITY AS CACO3 (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 22... | 1815 | 6.5 | -- | 335 | 10.8 | 8.0 | 156 | 0 |
| JAN. | | | | | | | | |
| 18... | 1400 | .0 | 6.0 | 205 | 12.7 | 7.5 | 148 | 18 |
| APR. | | | | | | | | |
| 14... | 1230 | 6.0 | 10.5 | 230 | 12.4 | 8.2 | 141 | 10 |
| MAY | | | | | | | | |
| 20... | 0930 | 5.5 | 3.5 | 215 | 12.2 | 7.7 | 98 | 20 |

12301300 TOBACCO RIVER NEAR EUREKA, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971.
Water temperatures: November 1970 to September 1971.

EXTREMES.--1970-71:
Water temperatures: Maximum, 22.0°C Aug. 4, 7; minimum, freezing point on many days during November to March.

REMARKS.--Recorder stopped Nov. 22 to Dec. 7; range in temperature, 0.0°C to 0.5°C. Recorder inoperative Apr. 24-29, May 15-19.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | COLOR (PLAT-INUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | ORGANIC NITRO-GEN (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | CARBON DIOXIDE (CO2) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 35.9 | 170 | 0 | .00 | -- | .01 | -- | .12 | -- | -- | 23 | -- |
| JAN. | | | | | | | | | | | | |
| 18... | 46.7 | 160 | 4 | -- | .020 | .00 | .02 | .04 | -- | .02 | 2.0 | 9.4 |
| APR. | | | | | | | | | | | | |
| 14... | 122 | 140 | 10 | .1 | .000 | .21 | .36 | .09 | .080 | .00 | 119 | 1.7 |
| MAY | | | | | | | | | | | | |
| 20... | 236 | 94 | 20 | .00 | .000 | .05 | .22 | .03 | .090 | .00 | 12 | 3.8 |

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED LITHIUM (LI) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 22... | 0 | 10 | 16 | 12 | .2 | 0 | 0 | 0 | 170 | .0 | 10 |
| JAN. | | | | | | | | | | | |
| 18... | 0 | 0 | 14 | 0 | -- | 7 | 4 | 0 | 110 | .0 | 20 |
| APR. | | | | | | | | | | | |
| 14... | 0 | 13 | 12 | 10 | .1 | 0 | 0 | 0 | 160 | .0 | 20 |
| MAY | | | | | | | | | | | |
| 20... | 1 | 1 | 7.9 | 20 | .1 | 5 | 2 | 0 | 120 | .3 | 30 |

12301300 TOBACCO RIVER NEAR EUREKA, MONT.--Continued

TEMPERATURE (°C) OF WATER, NOVEMBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 1.0 | 0.5 | 0.0 | 0.0 |
| 2 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 1.0 | 0.5 | 0.0 | 0.0 |
| 3 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 4 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 5 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | --- | --- | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 |
| 8 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 |
| 9 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.5 |
| 10 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 1.0 |
| 11 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 1.0 |
| 12 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 4.5 | 2.0 |
| 13 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 | 4.0 | 2.0 |
| 14 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 3.5 | 1.0 |
| 15 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 4.0 | 2.0 |
| 16 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 4.5 | 2.0 |
| 17 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.5 | 4.0 | 1.0 |
| 18 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 4.0 | 1.0 |
| 19 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.5 | 4.0 | 1.0 |
| 20 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 | 4.0 | 1.0 |
| 21 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 4.0 | 0.5 |
| 22 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 2.5 | 0.5 |
| 23 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.0 | 2.5 | 0.5 |
| 24 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 1.0 | 5.0 | 2.0 |
| 25 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 5.0 | 1.5 |
| 26 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 3.0 | 0.5 |
| 27 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 2.0 |
| 28 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 2.0 |
| 29 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 5.0 | 3.0 |
| 30 | --- | --- | --- | --- | 0.0 | 0.0 | 0.5 | 0.0 | --- | --- | 6.5 | 2.5 |
| 31 | --- | --- | --- | --- | 0.0 | 0.0 | 0.5 | 0.5 | --- | --- | 5.0 | 3.0 |
| MONTH | --- | --- | --- | --- | --- | --- | 0.5 | 0.0 | 3.0 | 0.0 | 6.5 | 0.0 |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.

LOCATION.--Lat 48°52'28", long 115°13'37", in SE¼NE¼NW¼ sec.21, T.36 N., R.28 W., Lincoln County, at gaging station at bridge on State Highway 37, 300 ft downstream from Sullivan Creek, 1.1 miles southwest of Rexford, 3.5 miles downstream from Tobacco River, and at mile 260.5.

DRAINAGE AREA.--8,420 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1971.
Water temperatures: October 1967 to September 1971 (discontinued).
Sediment records: October 1967 to September 1971 (discontinued).

EXTREMES.--1970-71:
Water temperatures: Maximum observed, 20.5°C Aug. 1; minimum, freezing point on many days during December and January.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | SILICA (SIO2) (MG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1715 | 4000 | 6.6 | 44 | 4.4 | .8 | 42 | 3.8 | .8 | 0 | 190 | .26 |
| NOV. | | | | | | | | | | | | |
| 13... | 1400 | 3310 | 5.7 | 42 | 4.3 | .8 | 42 | 4.6 | 1.0 | 50 | 194 | .26 |
| DEC. | | | | | | | | | | | | |
| 08... | 1100 | 3800 | 7.4 | 45 | 6.0 | .9 | 43 | 4.2 | .9 | 0 | 210 | .29 |
| JAN. | | | | | | | | | | | | |
| 18... | 1130 | 2500 | 6.2 | 50 | 5.2 | .7 | 47 | 4.7 | 1.0 | 20 | 200 | .27 |
| FEB. | | | | | | | | | | | | |
| 18... | 1200 | 3740 | 7.0 | 44 | 4.1 | .7 | 38 | 3.1 | 1.2 | 0 | 200 | .27 |
| MAR. | | | | | | | | | | | | |
| 17... | 1030 | 2700 | 6.1 | 48 | 6.3 | 1.2 | 46 | 5.5 | 1.6 | 0 | 228 | .31 |
| APR. | | | | | | | | | | | | |
| 14... | 0900 | 4450 | 5.9 | 44 | 4.0 | .9 | 39 | 2.6 | 1.2 | 10 | 182 | .25 |
| MAY | | | | | | | | | | | | |
| 20... | 1200 | 25800 | 6.1 | 31 | 1.9 | .5 | 17 | 2.1 | .3 | 0 | 112 | .15 |
| JUNE | | | | | | | | | | | | |
| 09... | 1030 | 63900 | 4.8 | 26 | 1.1 | .2 | 12 | 1.1 | .2 | 30 | 120 | .16 |
| JULY | | | | | | | | | | | | |
| 15... | 1030 | 25200 | 4.4 | 28 | 1.9 | .4 | 15 | 2.7 | .1 | 10 | 116 | .16 |
| AUG. | | | | | | | | | | | | |
| 10... | 1030 | 13900 | 3.6 | 29 | 3.5 | .5 | 19 | 2.4 | .4 | 0 | 116 | .16 |
| SEP. | | | | | | | | | | | | |
| 07... | 0800 | 7550 | 4.8 | 35 | 3.1 | .7 | 28 | 3.0 | .6 | 10 | 150 | .20 |

12301300 TOBACCO RIVER NEAR EUREKA, MONT.--Continued

TEMPERATURE (°C) OF WATER, NOVEMBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.5 | 1.5 | 8.0 | 7.0 | 8.0 | 7.5 | 12.0 | 9.5 | 21.0 | 14.5 | 13.0 | 12.0 |
| 2 | 5.0 | 3.0 | 8.5 | 8.0 | 8.0 | 7.5 | 13.0 | 9.5 | 21.0 | 14.5 | 12.5 | 11.5 |
| 3 | 6.5 | 2.0 | 9.5 | 8.5 | 8.0 | 7.5 | 12.5 | 9.0 | 21.0 | 16.0 | 13.0 | 11.5 |
| 4 | 7.0 | 2.0 | 9.0 | 8.5 | 8.0 | 7.5 | 12.0 | 9.0 | 22.0 | 15.0 | 14.5 | 11.5 |
| 5 | 8.0 | 3.0 | 9.0 | 8.5 | 7.5 | 7.0 | 11.0 | 9.0 | 21.0 | 15.0 | 16.5 | 11.0 |
| 6 | 8.0 | 3.5 | 8.5 | 8.0 | 7.0 | 6.5 | 10.0 | 8.5 | 19.0 | 15.0 | 15.0 | 11.5 |
| 7 | 8.0 | 5.5 | 8.0 | 8.0 | 7.0 | 6.5 | 12.5 | 7.0 | 22.0 | 15.5 | 12.5 | 9.5 |
| 8 | 7.0 | 3.5 | 8.0 | 8.0 | 7.0 | 7.0 | 11.0 | 9.0 | 21.5 | 15.0 | 15.0 | 9.5 |
| 9 | 6.0 | 5.0 | 8.0 | 8.0 | 7.0 | 7.0 | 13.0 | 10.0 | 21.0 | 15.0 | 13.5 | 10.5 |
| 10 | 6.5 | 4.0 | 8.5 | 8.0 | 7.0 | 7.0 | 13.0 | 11.0 | 20.5 | 15.0 | 15.0 | 10.0 |
| 11 | 5.0 | 3.5 | 9.0 | 8.0 | 7.5 | 7.0 | 12.0 | 10.0 | 21.0 | 15.0 | 14.0 | 12.0 |
| 12 | 6.0 | 3.0 | 9.5 | 8.5 | 8.0 | 7.0 | 13.0 | 8.5 | 21.0 | 15.0 | 13.5 | 10.0 |
| 13 | 6.5 | 3.0 | 9.5 | 8.5 | 8.0 | 8.0 | 13.5 | 9.5 | 21.0 | 14.5 | 13.0 | 10.5 |
| 14 | 6.5 | 4.0 | 9.0 | 8.0 | 8.0 | 8.0 | 15.5 | 10.0 | 20.0 | 15.0 | 12.0 | 8.5 |
| 15 | 7.0 | 5.5 | --- | --- | 8.0 | 7.5 | 17.0 | 11.0 | 19.5 | 13.0 | 11.5 | 7.5 |
| 16 | 6.0 | 4.0 | --- | --- | 8.0 | 7.0 | 17.5 | 12.0 | 18.5 | 13.0 | 12.0 | 8.5 |
| 17 | 5.0 | 4.0 | --- | --- | 9.0 | 7.5 | 18.0 | 12.5 | 18.5 | 13.0 | 11.5 | 7.5 |
| 18 | 6.0 | 4.0 | --- | --- | 9.0 | 8.5 | 18.5 | 13.0 | 17.5 | 13.0 | 11.0 | 7.0 |
| 19 | 7.0 | 4.0 | --- | --- | 9.0 | 8.5 | 19.0 | 13.0 | 19.5 | 13.0 | 10.5 | 8.0 |
| 20 | 7.0 | 5.0 | 5.5 | 5.5 | 9.5 | 8.5 | 18.0 | 13.0 | 18.0 | 13.5 | 11.0 | 8.5 |
| 21 | 6.0 | 5.5 | 6.0 | 5.5 | 12.5 | 8.5 | 18.0 | 13.5 | 19.0 | 13.0 | 10.5 | 7.0 |
| 22 | 6.0 | 4.5 | 7.0 | 6.0 | 11.5 | 9.5 | 19.0 | 14.0 | 17.0 | 14.0 | 11.0 | 7.0 |
| 23 | 6.5 | 5.0 | 7.5 | 6.5 | 11.5 | 10.0 | 19.5 | 14.0 | 16.0 | 12.5 | 12.0 | 7.5 |
| 24 | --- | --- | 8.0 | 7.5 | 10.5 | 9.5 | 19.0 | 14.0 | 18.0 | 11.5 | 12.0 | 9.0 |
| 25 | --- | --- | 8.0 | 7.5 | 11.0 | 9.5 | 19.5 | 13.5 | 19.0 | 12.5 | 11.0 | 8.5 |
| 26 | --- | --- | 8.0 | 7.5 | 11.0 | 8.0 | 19.5 | 13.0 | 19.0 | 13.0 | 10.5 | 9.0 |
| 27 | --- | --- | 8.0 | 8.0 | 10.0 | 8.0 | 19.0 | 14.0 | 19.0 | 13.0 | 10.5 | 9.0 |
| 28 | --- | --- | 8.0 | 8.0 | 9.0 | 8.0 | 18.0 | 14.0 | 18.5 | 14.5 | 9.5 | 8.5 |
| 29 | --- | --- | 8.0 | 8.0 | 9.0 | 7.5 | 19.0 | 12.0 | 18.0 | 13.5 | 9.5 | 8.0 |
| 30 | 8.0 | 8.0 | 8.0 | 8.0 | 12.0 | 8.0 | 19.5 | 12.5 | 17.5 | 15.0 | 8.5 | 7.5 |
| 31 | --- | --- | 8.0 | 7.5 | --- | --- | 20.0 | 14.0 | 15.0 | 13.0 | --- | --- |
| MONTH | 8.0 | 1.5 | 9.5 | 5.5 | 12.5 | 6.5 | 20.0 | 7.0 | 22.0 | 11.5 | 16.5 | 7.0 |
| YEAR | 22.0 | 0.0 | | | | | | | | | | |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.--Continued

EXTREMES, 1970-71.--Continued
Sediment concentrations: Maximum daily, 616 mg/l May 14; minimum daily, 2 mg/l on several days during October to December.
Sediment discharge: Maximum daily, 106,000 tons May 29; minimum daily, 16 tons Dec. 3, 6.

Period of record:
Water temperatures: Maximum observed, 22.0°C July 19, 1970; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 870 mg/l June 4, 1968; minimum daily, 1 mg/l on several days during 1969.
Sediment discharge: Maximum daily, 150,000 tons June 4, 1968; minimum daily, 7.8 tons Jan. 23, 24, 1969.

REMARKS.--Flow affected by ice Nov. 22-24, Dec. 10 to Jan. 29, Feb. 5-13.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | METHYLENE BLUE ACTIVE SUBSTANCE (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | CARBON DIOXIDE (CO2) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 2050 | 160 | 0 | .2 | .020 | .07 | .16 | .58 | .19 | .00 | 2.0 | 3.4 |
| NOV. | | | | | | | | | | | | |
| 13... | 1730 | 160 | 3 | .2 | .020 | .09 | .11 | 1.1 | .38 | .01 | 9.0 | 3.8 |
| DEC. | | | | | | | | | | | | |
| 08... | 2160 | 170 | 5 | .3 | .010 | .11 | .18 | .61 | .28 | .01 | 4.0 | 10 |
| JAN. | | | | | | | | | | | | |
| 18... | 1350 | 180 | 4 | -- | .000 | .00 | .00 | .04 | -- | .07 | 3.0 | 13 |
| FEB. | | | | | | | | | | | | |
| 18... | 2020 | 160 | 0 | -- | .000 | .19 | .02 | .30 | .30 | .00 | 1.0 | 8.6 |
| MAR. | | | | | | | | | | | | |
| 17... | 1660 | 180 | -- | -- | .000 | .37 | .14 | .50 | .26 | -- | 6.0 | 1.5 |
| APR. | | | | | | | | | | | | |
| 14... | 2190 | 160 | 5 | .1 | .000 | .26 | .16 | .09 | .15 | .00 | 5.0 | 2.4 |
| MAY | | | | | | | | | | | | |
| 20... | 7800 | 110 | 10 | .1 | .000 | .05 | .22 | .25 | .20 | .00 | 2.0 | 3.7 |
| JUNE | | | | | | | | | | | | |
| 09... | 20700 | 91 | 10 | .1 | .000 | .24 | -- | .18 | .30 | .00 | 4.0 | 2.7 |
| JULY | | | | | | | | | | | | |
| 15... | 7890 | 100 | 5 | .00 | .000 | .07 | -- | .03 | .040 | .00 | 10 | 2.1 |
| AUG. | | | | | | | | | | | | |
| 10... | 4350 | 110 | 8 | .1 | .000 | .11 | -- | .03 | .050 | .00 | 14 | 1.5 |
| SEP. | | | | | | | | | | | | |
| 07... | 3060 | 130 | 10 | .1 | .000 | .08 | .09 | .09 | .11 | .00 | 1.0 | -- |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1715 | 4000 | 100 | 10 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 240 |
| NOV. | | | | | | | | | | | | |
| 13... | 1400 | 3310 | 100 | 0 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 10 |
| DEC. | | | | | | | | | | | | |
| 08... | 1100 | 3800 | 100 | 10 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 40 |
| JAN. | | | | | | | | | | | | |
| 18... | 1130 | 2500 | 200 | 10 | 0 | 0 | 0 | -- | 0 | 0 | 1 | 110 |
| FEB. | | | | | | | | | | | | |
| 18... | 1200 | 3740 | 400 | 10 | 320 | 10 | 0 | -- | 0 | 3 | 2 | 180 |
| MAR. | | | | | | | | | | | | |
| 17... | 1030 | 2700 | 100 | 10 | 130 | 2 | 0 | -- | 0 | 4 | 1 | 140 |
| APR. | | | | | | | | | | | | |
| 14... | 0900 | 4450 | 300 | 0 | 300 | 2 | 0 | -- | 0 | 4 | 2 | 30 |
| MAY | | | | | | | | | | | | |
| 20... | 1200 | 25800 | 300 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| JUNE | | | | | | | | | | | | |
| 09... | 1030 | 63900 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 40 |
| JULY | | | | | | | | | | | | |
| 15... | 1030 | 25200 | 300 | 0 | 100 | 0 | 0 | 0 | 0 | 2 | 1 | 20 |
| AUG. | | | | | | | | | | | | |
| 10... | 1030 | 13900 | 100 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |
| SEP. | | | | | | | | | | | | |
| 07... | 0800 | 7550 | 200 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL COBALT (CO) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JAN. | | | | | | | | | | |
| 18... | 1130 | 2500 | -- | -- | -- | -- | -- | -- | .0 | -- |
| MAY | | | | | | | | | | |
| 20... | 1200 | 25800 | 1 | 1 | 10 | 740 | 9 | 30 | .5 | 30 |
| JUNE | | | | | | | | | | |
| 09... | 1030 | 63900 | 1 | 4 | 10 | 3300 | 27 | 150 | -- | 10 |
| JULY | | | | | | | | | | |
| 15... | 1030 | 25200 | 1 | 1 | 10 | 340 | 3 | 10 | .5 | 10 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | ALKA-LINITY AS CACO3 (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 22... | 1715 | 5.5 | -- | 345 | 11.6 | 7.8 | 111 | 2 |
| NOV. | | | | | | | | |
| 13... | 1400 | 4.0 | 7.0 | 335 | 11.9 | 7.8 | 125 | 2 |
| DEC. | | | | | | | | |
| 08... | 1100 | .0 | -1.0 | 225 | 12.5 | 7.4 | 130 | 1 |
| JAN. | | | | | | | | |
| 18... | 1130 | .0 | 4.0 | 380 | 11.7 | 7.3 | 133 | 0 |
| FEB. | | | | | | | | |
| 18... | 1200 | .5 | 2.0 | 215 | 12.9 | 7.4 | 112 | 3 |
| MAR. | | | | | | | | |
| 17... | 1030 | 2.0 | 1.0 | 370 | 12.5 | 8.2 | 125 | 3 |
| APR. | | | | | | | | |
| 14... | 0900 | 6.0 | 3.0 | 340 | 12.0 | 8.0 | 122 | 4 |
| MAY | | | | | | | | |
| 20... | 1200 | 7.0 | 4.0 | 245 | 12.0 | 7.7 | 95 | 20 |
| JUNE | | | | | | | | |
| 09... | 1030 | 8.0 | 12.5 | 195 | 11.4 | 7.8 | 88 | 20 |
| JULY | | | | | | | | |
| 15... | 1030 | 12.0 | -- | 215 | 10.4 | 7.9 | 85 | 7 |
| AUG. | | | | | | | | |
| 10... | 1030 | 17.5 | 22.0 | 215 | 9.4 | 8.1 | 93 | 3 |
| SEP. | | | | | | | | |
| 07... | 0800 | 11.5 | 7.0 | 280 | 10.0 | 7.0 | 104 | 4 |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED LITHIUM (LI) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 22... | 0 | 0 | 12 | 18 | .0 | 0 | 1 | 0 | 220 | .2 | 40 |
| NOV. | | | | | | | | | | | |
| 13... | 0 | 0 | 12 | 17 | .0 | 1 | 3 | 1 | 220 | .0 | 40 |
| DEC. | | | | | | | | | | | |
| 08... | 0 | 0 | 13 | 35 | .0 | 2 | 0 | 1 | 230 | .0 | 60 |
| JAN. | | | | | | | | | | | |
| 18... | 0 | 0 | 14 | 0 | -- | 0 | 1 | 0 | 180 | .0 | 60 |
| FEB. | | | | | | | | | | | |
| 18... | 0 | 10 | 13 | 430 | .0 | 0 | 0 | 1 | 240 | .8 | 73 |
| MAR. | | | | | | | | | | | |
| 17... | 5 | 0 | 14 | 86 | .1 | 12 | 3 | 1 | 300 | .9 | 78 |
| APR. | | | | | | | | | | | |
| 14... | 3 | 13 | 13 | 40 | .1 | 0 | 0 | 1 | 270 | .0 | 30 |
| MAY | | | | | | | | | | | |
| 20... | 3 | 16 | 8.6 | 0 | .3 | 0 | 0 | 0 | 160 | .0 | 20 |
| JUNE | | | | | | | | | | | |
| 09... | 5 | 0 | 6.3 | 40 | .0 | 0 | 0 | 0 | 30 | .0 | 0 |
| JULY | | | | | | | | | | | |
| 15... | 1 | 25 | 7.4 | 47 | .3 | 4 | 3 | 0 | 140 | .0 | 8 |
| AUG. | | | | | | | | | | | |
| 10... | 0 | 0 | 8.6 | 30 | .0 | 0 | 14 | 0 | 110 | .0 | 10 |
| SEP. | | | | | | | | | | | |
| 07... | 0 | 10 | 10 | 10 | .0 | 3 | 2 | 0 | 180 | .3 | 30 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13.0 | 4.0 | --- | 2.0 | --- | 0.5 | 5.0 | 12.0 | 10.0 | 13.5 | 20.5 | 12.5 |
| 2 | 13.0 | 3.5 | 1.5 | 0.0 | 3.0 | 0.5 | 5.5 | 12.5 | 10.5 | 13.5 | 17.5 | 12.0 |
| 3 | 13.0 | 3.5 | 1.5 | 0.0 | 3.5 | 1.5 | 5.5 | 12.0 | 11.0 | 14.0 | 18.0 | 12.0 |
| 4 | 13.0 | 3.5 | 1.5 | 0.0 | 3.0 | 2.0 | 5.5 | 11.0 | 10.0 | 13.0 | 16.5 | 12.5 |
| 5 | 11.0 | 3.5 | --- | 0.0 | --- | 2.5 | 6.0 | 9.5 | 9.0 | 12.0 | 17.0 | 14.5 |
| 6 | 9.0 | 3.5 | 1.0 | 0.0 | --- | 3.0 | 6.5 | 9.5 | 10.0 | 12.5 | 16.5 | 14.0 |
| 7 | 8.0 | 4.5 | 1.0 | 0.0 | --- | 1.5 | 6.0 | 10.0 | 10.5 | 13.5 | 17.0 | 11.0 |
| 8 | 7.0 | 4.5 | 1.0 | 0.0 | --- | 1.5 | 5.5 | 10.5 | 11.0 | 14.0 | 18.5 | 6.5 |
| 9 | 7.5 | 4.0 | 1.0 | 0.0 | --- | 1.5 | 5.5 | 11.0 | 10.5 | 14.5 | 17.5 | 11.0 |
| 10 | 8.0 | 4.0 | 1.0 | 0.0 | 3.0 | 2.5 | 5.5 | 11.0 | 10.5 | 14.0 | 17.0 | 10.0 |
| 11 | 8.0 | 4.0 | 1.0 | 0.0 | 3.0 | 3.0 | 5.0 | 12.0 | 11.0 | 12.0 | 17.0 | --- |
| 12 | 8.0 | 4.0 | 1.5 | 0.0 | 3.0 | 3.5 | 4.0 | 12.0 | 13.0 | 15.0 | 17.0 | 14.5 |
| 13 | 8.0 | 4.0 | 1.0 | 0.0 | 3.0 | 4.0 | 5.0 | 12.0 | 12.0 | 15.5 | 17.0 | 11.5 |
| 14 | 8.0 | --- | 1.0 | 0.0 | 3.0 | 3.5 | 5.5 | 11.0 | 10.0 | 15.5 | 17.0 | 9.0 |
| 15 | 7.0 | 3.5 | 1.0 | 0.0 | 3.0 | 3.5 | 5.5 | 5.5 | 11.0 | 16.0 | 15.5 | 9.0 |
| 16 | 6.5 | 3.5 | 1.0 | 0.0 | 3.0 | 3.5 | 5.5 | 8.0 | 11.5 | 16.5 | 15.0 | 9.0 |
| 17 | 6.0 | 3.5 | 1.0 | 0.0 | --- | 2.5 | 7.0 | 9.0 | 11.5 | 17.5 | 15.0 | 7.0 |
| 18 | 6.0 | 3.5 | 1.0 | 0.0 | 3.0 | 2.0 | 9.0 | 9.5 | 12.0 | 18.0 | 15.5 | 9.5 |
| 19 | 6.5 | 3.5 | 1.0 | 0.0 | 3.0 | 2.0 | 11.0 | 8.0 | 12.0 | 18.0 | 15.0 | 9.0 |
| 20 | 6.5 | 4.0 | --- | 0.0 | 3.0 | 2.0 | 10.5 | 7.0 | 12.0 | 17.0 | 15.0 | 9.0 |
| 21 | --- | 4.0 | 1.0 | 0.0 | 3.0 | 2.0 | 9.5 | 10.0 | 14.0 | 17.0 | 18.0 | 7.0 |
| 22 | 6.5 | 3.0 | --- | 0.0 | 3.0 | 2.5 | 9.5 | 12.0 | 13.5 | 19.0 | 16.5 | 7.0 |
| 23 | 6.5 | 3.0 | 1.0 | 0.0 | 2.0 | 2.5 | 10.0 | 12.0 | 12.5 | 19.0 | 14.0 | 8.5 |
| 24 | 5.5 | 2.5 | 0.0 | --- | 3.0 | 3.0 | 10.0 | 12.0 | 13.5 | 18.0 | 15.0 | 10.0 |
| 25 | 5.5 | 2.5 | 0.0 | 0.0 | 2.0 | 4.0 | 9.5 | 12.0 | 14.5 | 18.0 | 15.0 | 9.5 |
| 26 | 5.0 | 2.5 | 0.0 | 0.0 | 2.0 | 4.0 | 8.5 | 12.0 | 13.5 | 19.0 | 14.5 | 9.5 |
| 27 | --- | 2.5 | --- | --- | 1.5 | 4.0 | 8.5 | 12.0 | 13.0 | 19.0 | 16.0 | 9.0 |
| 28 | 4.5 | --- | 1.0 | 3.5 | 1.0 | 4.0 | 8.0 | 11.0 | 12.0 | 18.0 | 17.0 | 9.5 |
| 29 | 4.0 | 2.0 | 1.0 | --- | --- | 4.5 | 8.5 | 11.0 | 11.0 | 17.5 | 17.0 | 9.0 |
| 30 | 4.0 | 2.0 | 1.0 | 4.5 | --- | 4.5 | 11.5 | 10.0 | 12.0 | 18.5 | 16.5 | 8.0 |
| 31 | 4.0 | --- | 1.0 | 2.5 | --- | 5.0 | --- | 10.0 | --- | 19.0 | 15.5 | --- |
| MONTH | 7.5 | 3.5 | 1.0 | 0.5 | --- | 3.0 | 7.5 | 10.5 | 11.5 | 16.0 | 16.5 | 10.0 |
| YEAR | 8.0 | | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MAY | | | | | | | | | | | |
| 14... | 1300 | 7.0 | 60100 | 824 | 134000 | 13 | 36 | 76 | 91 | 98 | 100 |
| JUNE | | | | | | | | | | | |
| 02... | 1200 | 8.5 | 53100 | 173 | 24800 | -- | -- | 77 | 88 | 99 | 100 |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 4910 | 2 | 27 | 3600 | 2 | 19 | 2800 | 7 | 53 |
| 2 | 4910 | 4 | 53 | 3650 | 4 | 39 | 2880 | 5 | 39 |
| 3 | 4860 | 4 | 52 | 3600 | 2 | 19 | 2880 | 2 | 16 |
| 4 | 4770 | 6 | 77 | 3620 | 2 | 20 | 2880 | 6 | 47 |
| 5 | 4770 | 4 | 52 | 3480 | 2 | 19 | 2900 | 3 | 23 |
| 6 | 4880 | 6 | 79 | 3560 | 2 | 19 | 2900 | 2 | 16 |
| 7 | 5080 | 5 | 69 | 3620 | 2 | 20 | 3360 | 9 | 82 |
| 8 | 5130 | 5 | 69 | 3640 | 2 | 20 | 3780 | 7 | 71 |
| 9 | 5020 | 4 | 54 | 3670 | 2 | 20 | 3670 | 26 | 258 |
| 10 | 4880 | 3 | 40 | 3730 | 4 | 40 | 3400 | 14 | 129 |
| 11 | 4710 | 4 | 51 | 3680 | 2 | 20 | 3200 | 7 | 60 |
| 12 | 4580 | 4 | 49 | 3670 | 2 | 20 | 3000 | 6 | 49 |
| 13 | 4580 | 4 | 49 | 3620 | 2 | 20 | 2800 | 6 | 45 |
| 14 | 4420 | 4 | 48 | 3570 | 5 | 48 | 2700 | 8 | 58 |
| 15 | 4320 | 4 | 47 | 3510 | 7 | 66 | 2900 | 7 | 55 |
| 16 | 4220 | 8 | 91 | 3510 | 8 | 76 | 3000 | 7 | 57 |
| 17 | 4220 | 3 | 34 | 3460 | 3 | 28 | 3100 | 8 | 67 |
| 18 | 4180 | 6 | 68 | 3420 | 5 | 46 | 3200 | 9 | 78 |
| 19 | 4000 | 4 | 43 | 3420 | 7 | 65 | 3100 | 7 | 59 |
| 20 | 4060 | 6 | 66 | 3420 | 5 | 46 | 3000 | 6 | 49 |
| 21 | 4080 | 6 | 66 | 3400 | 45 | 413 | 2700 | 5 | 36 |
| 22 | 4090 | 5 | 55 | 2500 | 23 | 155 | 2300 | 7 | 43 |
| 23 | 3910 | 5 | 53 | 2000 | 23 | 124 | 1800 | 9 | 44 |
| 24 | 4110 | 6 | 67 | 2200 | 24 | 143 | 1400 | 18 | 68 |
| 25 | 4110 | 4 | 44 | 2820 | 7 | 53 | 1800 | 20 | 97 |
| 26 | 4110 | 4 | 44 | 2820 | 5 | 38 | 2100 | 10 | 57 |
| 27 | 4000 | 4 | 43 | 2820 | 4 | 30 | 2400 | 12 | 78 |
| 28 | 3910 | 4 | 42 | 2750 | 8 | 59 | 2600 | 15 | 105 |
| 29 | 3670 | 5 | 50 | 2680 | 10 | 72 | 2800 | 16 | 121 |
| 30 | 3600 | 7 | 68 | 2780 | 9 | 68 | 3000 | 10 | 81 |
| 31 | 3600 | 5 | 49 | -- | -- | -- | 3000 | 6 | 49 |
| TOTAL | 135690 | -- | 1699 | 98220 | -- | 1825 | 87350 | -- | 2090 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 3000 | 15 | 122 | 4100 | 17 | 188 | 3020 | 7 | 57 |
| 2 | 2500 | 14 | 95 | 4600 | 7 | 87 | 3020 | 7 | 57 |
| 3 | 2000 | 10 | 54 | 4620 | 4 | 50 | 2860 | 6 | 46 |
| 4 | 1800 | 9 | 44 | 4620 | 7 | 87 | 2820 | 7 | 53 |
| 5 | 1700 | 12 | 55 | 4500 | 3 | 36 | 2840 | 6 | 46 |
| 6 | 1600 | 23 | 99 | 4000 | 10 | 108 | 2760 | 6 | 45 |
| 7 | 1900 | 12 | 62 | 3500 | 14 | 132 | 2830 | 8 | 61 |
| 8 | 2000 | 7 | 38 | 3000 | 19 | 154 | 2840 | 6 | 46 |
| 9 | 2100 | 7 | 40 | 3200 | 13 | 112 | 2840 | 6 | 46 |
| 10 | 2000 | 9 | 49 | 3400 | 6 | 55 | 2880 | 7 | 54 |
| 11 | 1900 | 10 | 51 | 3600 | 10 | 97 | 2910 | 8 | 63 |
| 12 | 1800 | 8 | 39 | 3800 | 24 | 246 | 2910 | 8 | 63 |
| 13 | 1900 | 6 | 31 | 4000 | 16 | 173 | 2910 | 8 | 63 |
| 14 | 2000 | 5 | 27 | 4200 | 16 | 181 | 2880 | 7 | 54 |
| 15 | 2100 | 7 | 40 | 4060 | 19 | 208 | 2860 | 9 | 69 |
| 16 | 2200 | 7 | 42 | 4020 | 11 | 119 | 2780 | 8 | 60 |
| 17 | 2400 | 12 | 78 | 3900 | 11 | 116 | 2800 | 9 | 68 |
| 18 | 2700 | 7 | 51 | 3720 | 20 | 201 | 2750 | 10 | 74 |
| 19 | 3000 | 4 | 32 | 3420 | 17 | 157 | 2730 | 12 | 88 |
| 20 | 3500 | 8 | 76 | 3380 | 10 | 91 | 2730 | 6 | 44 |
| 21 | 3800 | 83 | 852 | 3380 | 7 | 64 | 2710 | 6 | 44 |
| 22 | 3800 | 137 | 1410 | 3380 | 6 | 55 | 2700 | 6 | 44 |
| 23 | 3500 | 47 | 444 | 3300 | 6 | 53 | 2680 | 11 | 80 |
| 24 | 3200 | 22 | 190 | 3240 | 7 | 61 | 2700 | 14 | 102 |
| 25 | 3200 | 21 | 181 | 3300 | 7 | 62 | 2730 | 11 | 81 |
| 26 | 3300 | 18 | 160 | 3210 | 7 | 61 | 2790 | 9 | 68 |
| 27 | 3400 | 18 | 165 | 3110 | 6 | 50 | 2830 | 11 | 84 |
| 28 | 3500 | 25 | 236 | 3020 | 9 | 73 | 2820 | 12 | 91 |
| 29 | 3700 | 18 | 180 | -- | -- | -- | 2800 | 13 | 98 |
| 30 | 4020 | 8 | 87 | -- | -- | -- | 2920 | 28 | 221 |
| 31 | 3680 | 17 | 169 | -- | -- | -- | 3020 | 14 | 114 |
| TOTAL | 83200 | -- | 5199 | 103580 | -- | 3077 | 87670 | -- | 2184 |

12301500 KOOTENAI RIVER NEAR REXFORD, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 3040 | 16 | 131 | 13500 | 50 | 1820 | 56900 | 206 | 31600 |
| 2 | 3000 | 17 | 138 | 14900 | 49 | 1970 | 52600 | 183 | 26000 |
| 3 | 2950 | 15 | 119 | 18500 | 128 | 6390 | 52600 | 171 | 24300 |
| 4 | 2910 | 59 | 464 | 24800 | 267 | 17900 | 54200 | 270 | 39500 |
| 5 | 2960 | 7 | 56 | 31700 | 366 | 31300 | 57500 | 245 | 38000 |
| 6 | 3210 | 32 | 277 | 36000 | 362 | 35200 | 60700 | 256 | 42000 |
| 7 | 3330 | 120 | 1080 | 36700 | 239 | 23700 | 61400 | 304 | 50400 |
| 8 | 3760 | 24 | 244 | 35600 | 229 | 22000 | 62500 | 285 | 48100 |
| 9 | 4150 | 33 | 370 | 37000 | 233 | 23300 | 63100 | 243 | 41400 |
| 10 | 4800 | 61 | 791 | 39200 | 212 | 22400 | 57100 | 218 | 33600 |
| 11 | 4970 | 31 | 416 | 40100 | 213 | 23100 | 51100 | 170 | 23500 |
| 12 | 4770 | 36 | 464 | 42900 | 344 | 39800 | 45500 | 169 | 20800 |
| 13 | 4500 | 26 | 316 | 50200 | 351 | 47600 | 45000 | 158 | 19200 |
| 14 | 4440 | 19 | 228 | 56600 | 616 | 94100 | 48100 | 169 | 21900 |
| 15 | 4820 | 27 | 351 | 51500 | 338 | 47000 | 47300 | 132 | 16900 |
| 16 | 5380 | 35 | 508 | 43600 | 208 | 24500 | 42400 | 124 | 14200 |
| 17 | 5500 | 32 | 475 | 36700 | 150 | 14900 | 38000 | 120 | 12300 |
| 18 | 5380 | 37 | 537 | 31200 | 99 | 8340 | 35800 | 106 | 10200 |
| 19 | 5210 | 23 | 324 | 28000 | 65 | 4910 | 34300 | 83 | 7690 |
| 20 | 5500 | 25 | 371 | 26700 | 52 | 3750 | 34500 | 73 | 6800 |
| 21 | 6420 | 49 | 849 | 26000 | 61 | 4280 | 37100 | 101 | 10100 |
| 22 | 7680 | 109 | 2260 | 25500 | 55 | 3790 | 41900 | 160 | 18100 |
| 23 | 9070 | 118 | 2890 | 26700 | 86 | 6200 | 47900 | 205 | 26500 |
| 24 | 11300 | 89 | 2720 | 30100 | 130 | 10600 | 52900 | 299 | 42700 |
| 25 | 14400 | 133 | 5170 | 36600 | 165 | 16300 | 54300 | 207 | 30300 |
| 26 | 16700 | 198 | 8930 | 45400 | 284 | 34800 | 52100 | 212 | 29800 |
| 27 | 16100 | 186 | 8090 | 53100 | 422 | 60500 | 46100 | 199 | 24800 |
| 28 | 14800 | 73 | 2920 | 63100 | 589 | 100000 | 39300 | 140 | 14900 |
| 29 | 13800 | 44 | 1640 | 65800 | 597 | 106000 | 34500 | 95 | 8850 |
| 30 | 13300 | 40 | 1440 | 62000 | 315 | 52700 | 32400 | 92 | 8050 |
| 31 | -- | -- | -- | 59000 | 257 | 40900 | -- | -- | -- |
| TOTAL | 208150 | -- | 44569 | 1188700 | -- | 930050 | 1439100 | -- | 742490 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 31700 | 81 | 6930 | 18300 | 19 | 939 | 8230 | 16 | 356 |
| 2 | 31700 | 64 | 5480 | 18300 | 19 | 939 | 8620 | 16 | 372 |
| 3 | 31500 | 58 | 4930 | 18300 | 18 | 889 | 8800 | 20 | 475 |
| 4 | 29700 | 46 | 3690 | 18100 | 20 | 977 | 8470 | 11 | 252 |
| 5 | 28200 | 48 | 3650 | 17300 | 20 | 934 | 7870 | 10 | 212 |
| 6 | 26700 | 56 | 4040 | 16300 | 27 | 1190 | 7510 | 12 | 243 |
| 7 | 25300 | 58 | 3960 | 15700 | 24 | 1020 | 7310 | 9 | 178 |
| 8 | 23100 | 53 | 3310 | 15100 | 15 | 612 | 7480 | 8 | 162 |
| 9 | 21200 | 50 | 2860 | 14700 | 18 | 714 | 8110 | 9 | 197 |
| 10 | 25400 | 65 | 4460 | 14200 | 15 | 575 | 7680 | 8 | 166 |
| 11 | 30100 | 101 | 8210 | 13900 | 9 | 338 | 7400 | 7 | 140 |
| 12 | 29100 | 99 | 7780 | 13000 | 18 | 632 | 7030 | 6 | 114 |
| 13 | 28000 | 71 | 5370 | 12500 | 16 | 540 | 6950 | 7 | 131 |
| 14 | 26900 | 49 | 3560 | 11900 | 16 | 514 | 6950 | 7 | 131 |
| 15 | 26100 | 29 | 2040 | 11500 | 17 | 528 | 6600 | 7 | 125 |
| 16 | 27200 | 28 | 2060 | 10900 | 18 | 530 | 6340 | 7 | 120 |
| 17 | 28700 | 33 | 2560 | 10300 | 15 | 417 | 5900 | 7 | 112 |
| 18 | 29300 | 37 | 2930 | 9780 | 14 | 370 | 5830 | 5 | 79 |
| 19 | 28500 | 35 | 2690 | 9340 | 16 | 403 | 5710 | 5 | 77 |
| 20 | 29500 | 32 | 2550 | 8950 | 11 | 266 | 5660 | 6 | 92 |
| 21 | 30000 | 31 | 2510 | 8440 | 9 | 205 | 5590 | 6 | 91 |
| 22 | 29900 | 35 | 2830 | 8440 | 12 | 273 | 5470 | 5 | 74 |
| 23 | 28800 | 38 | 2950 | 8560 | 13 | 300 | 5300 | 5 | 72 |
| 24 | 28200 | 31 | 2360 | 8680 | 18 | 422 | 5150 | 5 | 70 |
| 25 | 25100 | 28 | 1900 | 8500 | 12 | 275 | 5060 | 5 | 68 |
| 26 | 22900 | 23 | 1420 | 8140 | 10 | 220 | 5060 | 4 | 55 |
| 27 | 21400 | 20 | 1160 | 7930 | 11 | 236 | 4990 | 5 | 67 |
| 28 | 20400 | 19 | 1050 | 7310 | 9 | 178 | 4990 | 6 | 81 |
| 29 | 20000 | 18 | 972 | 7400 | 9 | 180 | 5080 | 5 | 69 |
| 30 | 18900 | 17 | 868 | 7590 | 10 | 205 | 4930 | 4 | 53 |
| 31 | 18100 | 14 | 684 | 7790 | 16 | 337 | -- | -- | -- |
| TOTAL | 821600 | -- | 101764 | 367150 | -- | 16158 | 196070 | -- | 4434 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 4816480
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 1855539

12301850 KOOTENAI RIVER AT WARLAND BRIDGE, NEAR LIBBY, MONT.

LOCATION.--Lat 48°30'00", long 115°17'02", in NW¼NE¼NE¼ sec.34, T.32 N., R.29 W., Lincoln County, temperature recorder at gaging station on right bank at county road bridge, 0.1 mile downstream from Barron Creek, 14.5 miles northeast of Libby, and at mile 228.6.

DRAINAGE AREA.--8,892 sq mi, approximately.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 11.5 | 10.0 | 3.5 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 11.5 | 10.0 | 3.5 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | 11.5 | 10.0 | 3.5 | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 11.5 | 10.0 | 3.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 11.5 | 10.5 | 3.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 11.5 | 9.0 | 4.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 10.0 | 7.0 | 4.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 8.5 | 6.5 | 4.0 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 8.0 | 6.0 | 4.5 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 4.0 |
| 14 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 15 | 7.0 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 16 | 6.5 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 17 | 6.5 | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.0 |
| 18 | 6.5 | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.0 |
| 19 | 7.0 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.0 |
| 20 | 7.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 21 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.0 |
| 22 | 7.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 2.0 |
| 23 | 7.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 3.5 | 1.5 |
| 24 | 7.0 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 2.0 |
| 25 | 6.5 | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 4.0 |
| 26 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 4.0 |
| 27 | 5.0 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 4.0 |
| 28 | 4.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 4.0 |
| 29 | 4.5 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 4.0 |
| 30 | 4.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | 7.0 | 5.0 |
| 31 | 4.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | 7.0 | 5.5 |
| MONTH | 11.5 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

12301850 KOOTENAI RIVER AT WARLAND BRIDGE, NEAR LIBBY, MONT.--Continued

PERIOD OF RECORD: Water temperatures: June 1962 to September 1971 (seasonal records only)(discontinued).

EXTREMES.--1970-71:
Water temperatures: Maximum recorded, 19.5°C Aug. 3, 9-12.

Period of record:
Water temperatures: Maximum, 20.5°C on several days in 1970.

REMARKS.--Recorder removed Nov. 10 to Mar. 12. Recorder inoperative June 22 to Aug. 2. Records furnished by Corps of Engineers, U.S. Army.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 7.0 | 4.5 | 9.5 | 8.0 | 10.0 | 8.5 | --- | --- | --- | --- | 16.5 | 14.0 |
| 2 | 7.0 | 5.0 | 10.5 | 8.5 | 10.0 | 9.0 | --- | --- | --- | --- | 15.0 | 13.0 |
| 3 | 8.0 | 5.0 | 10.5 | 9.0 | 10.5 | 9.5 | --- | --- | 19.5 | 18.0 | 14.0 | 13.0 |
| 4 | 8.5 | 5.5 | 10.5 | 9.0 | 10.5 | 9.5 | --- | --- | 19.0 | 18.0 | 14.0 | 13.0 |
| 5 | 9.5 | 6.0 | 10.5 | 8.5 | 10.5 | 8.5 | --- | --- | 19.0 | 17.0 | 15.0 | 13.0 |
| 6 | 9.0 | 6.5 | 9.5 | 8.0 | 9.5 | 8.0 | --- | --- | 18.5 | 17.0 | 15.0 | 13.5 |
| 7 | 9.0 | 7.0 | 9.0 | 8.0 | 9.5 | 8.5 | --- | --- | 19.0 | 17.0 | 14.5 | 13.0 |
| 8 | 9.5 | 7.0 | 9.5 | 8.0 | 10.0 | 8.5 | --- | --- | 19.0 | 17.0 | 14.0 | 12.0 |
| 9 | 9.0 | 7.0 | 9.5 | 8.0 | 10.0 | 9.0 | --- | --- | 19.5 | 18.0 | 14.0 | 13.0 |
| 10 | 9.0 | 6.5 | 10.0 | 8.5 | 10.0 | 8.5 | --- | --- | 19.5 | 18.0 | 14.5 | 13.0 |
| 11 | 8.0 | 5.5 | 10.0 | 8.5 | 9.5 | 8.5 | --- | --- | 19.5 | 18.0 | 14.5 | 13.5 |
| 12 | 8.0 | 5.5 | 10.0 | 9.0 | 10.5 | 8.5 | --- | --- | 19.5 | 18.0 | 14.5 | 13.0 |
| 13 | 8.5 | 5.5 | 10.0 | 9.0 | 11.0 | 9.5 | --- | --- | 19.0 | 17.0 | 14.5 | 13.0 |
| 14 | 9.0 | 6.0 | 10.0 | 8.0 | 11.0 | 10.0 | --- | --- | 19.0 | 17.0 | 14.0 | 11.5 |
| 15 | 9.0 | 7.0 | 9.0 | 6.5 | 11.0 | 9.0 | --- | --- | 19.0 | 16.5 | 13.0 | 11.0 |
| 16 | 9.0 | 6.5 | 8.0 | 6.5 | 10.0 | 9.0 | --- | --- | 18.0 | 16.5 | 12.0 | 10.5 |
| 17 | 8.5 | 6.0 | 8.0 | 6.5 | 10.5 | 9.0 | --- | --- | 18.0 | 16.0 | 12.0 | 10.5 |
| 18 | 8.5 | 6.0 | 9.0 | 6.5 | 11.0 | 9.5 | --- | --- | 18.0 | 16.0 | 11.5 | 10.0 |
| 19 | 9.5 | 6.5 | 9.5 | 8.0 | 11.0 | 10.0 | --- | --- | 17.0 | 15.5 | 11.0 | 10.0 |
| 20 | 9.5 | 8.0 | 9.5 | 7.0 | 11.0 | 10.0 | --- | --- | 17.0 | 16.0 | 11.5 | 10.0 |
| 21 | 9.0 | 8.0 | 8.5 | 6.5 | 11.5 | 10.0 | --- | --- | 17.0 | 16.0 | 11.5 | 10.0 |
| 22 | 9.0 | 7.0 | 10.0 | 7.0 | --- | --- | --- | --- | 17.0 | 15.5 | 11.5 | 10.0 |
| 23 | 9.0 | 8.0 | 11.0 | 9.0 | --- | --- | --- | --- | 16.5 | 15.0 | 12.0 | 10.0 |
| 24 | 9.5 | 8.0 | 11.0 | 10.0 | --- | --- | --- | --- | 16.0 | 14.5 | 12.0 | 11.0 |
| 25 | 9.5 | 8.0 | 11.0 | 10.0 | --- | --- | --- | --- | 16.5 | 15.0 | 12.0 | 10.5 |
| 26 | 9.0 | 7.0 | 11.0 | 10.0 | --- | --- | --- | --- | 17.0 | 15.5 | 11.5 | 10.0 |
| 27 | 8.5 | 7.0 | 11.0 | 10.0 | --- | --- | --- | --- | 18.0 | 16.0 | 11.0 | 10.0 |
| 28 | 8.5 | 6.5 | 11.0 | 9.5 | --- | --- | --- | --- | 18.0 | 16.5 | 11.0 | 10.0 |
| 29 | 8.5 | 6.5 | 10.5 | 9.0 | --- | --- | --- | --- | 18.0 | 16.5 | 11.0 | 9.5 |
| 30 | 9.0 | 7.0 | 10.0 | 9.0 | --- | --- | --- | --- | 18.0 | 16.5 | 10.5 | 9.0 |
| 31 | --- | --- | 10.0 | 9.0 | --- | --- | --- | --- | 18.0 | 15.5 | --- | --- |
| MONTH | 9.5 | 4.5 | 11.0 | 6.5 | --- | --- | --- | --- | 19.5 | 14.5 | 16.5 | 9.0 |
| YEAR | 19.5 | 1.0 | | | | | | | | | | |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.

LOCATION.--Lat 48°22'00", long 115°19'20", in SE¼NE¼ sec.17, T.30 N., R.29 W., Lincoln County, on downstream side of bridge 3.5 miles downstream from Libby Dam, 11 miles east of Libby, and at mile 218.2.

DRAINAGE AREA.--9,047 sq mi.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1971.
Water temperatures: October 1967 to September 1971.
Sediment records: October 1967 to September 1971.

EXTREMES.--1970-71:
Water temperatures: Maximum, 20.0°C Aug. 2, 3; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 692 mg/l May 29; minimum daily, 2 mg/l on several days during November and March.
Sediment discharge: Maximum daily, 125,000 tons May 29; minimum daily, 13 tons Jan. 7.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | SILICA (SIO2) (MG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1430 | 4220 | 5.1 | 43 | 4.3 | .8 | 41 | 4.6 | .9 | 0 | 187 | .25 |
| NOV. | | | | | | | | | | | | |
| 16... | 1245 | 3600 | 5.0 | 43 | 6.9 | .8 | 43 | 4.4 | .6 | 20 | 212 | .29 |
| DEC. | | | | | | | | | | | | |
| 07... | 1530 | 2950 | 7.5 | 46 | 5.7 | 1.1 | 46 | 5.2 | 1.1 | 10 | 214 | .29 |
| JAN. | | | | | | | | | | | | |
| 19... | 0930 | 2700 | 6.6 | 49 | 5.2 | .7 | 42 | 15 | .9 | 10 | 196 | .27 |
| FEB. | | | | | | | | | | | | |
| 19... | 1300 | 4900 | 7.0 | 42 | 4.1 | .9 | 35 | 3.1 | 1.1 | 0 | 198 | .27 |
| MAR. | | | | | | | | | | | | |
| 18... | 1000 | 3100 | 5.5 | 47 | 5.9 | 1.0 | 44 | 5.0 | 1.5 | 0 | 226 | .31 |
| APR. | | | | | | | | | | | | |
| 15... | 1300 | 6000 | 7.1 | 40 | 3.9 | 1.0 | 34 | 2.3 | 1.1 | 20 | 188 | .26 |
| MAY | | | | | | | | | | | | |
| 19... | 1200 | 31000 | 6.5 | 29 | 1.8 | .6 | 15 | 1.8 | .3 | 0 | 120 | .16 |
| JUNE | | | | | | | | | | | | |
| 10... | 1030 | 62000 | 5.0 | 26 | .8 | .5 | 11 | 1.0 | .2 | 20 | 122 | .17 |
| JULY | | | | | | | | | | | | |
| 14... | 1200 | 26800 | 4.4 | 27 | 1.5 | .4 | 25 | 1.4 | .2 | 10 | 118 | .16 |
| AUG. | | | | | | | | | | | | |
| 11... | 1100 | 14300 | 3.4 | 31 | 2.3 | .8 | 21 | 3.6 | .5 | 0 | 132 | .18 |
| SEP. | | | | | | | | | | | | |
| 08... | 1230 | 7100 | 4.9 | 36 | 3.2 | .6 | 28 | 2.7 | .7 | 10 | 150 | .20 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1430 | 4220 | 100 | 10 | 0 | 0 | 0 | -- | 0 | 0 | 17 | 70 |
| NOV. | | | | | | | | | | | | |
| 16... | 1245 | 3600 | 100 | 0 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 20 |
| DEC. | | | | | | | | | | | | |
| 07... | 1530 | 2950 | 100 | 20 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 30 |
| JAN. | | | | | | | | | | | | |
| 19... | 0930 | 2700 | 200 | 40 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 110 |
| FEB. | | | | | | | | | | | | |
| 19... | 1300 | 4900 | 300 | 10 | 220 | 5 | 0 | -- | 0 | 2 | 0 | 160 |
| MAR. | | | | | | | | | | | | |
| 18... | 1000 | 3100 | 100 | 10 | 220 | 0 | 1 | -- | 0 | 6 | 1 | 160 |
| APR. | | | | | | | | | | | | |
| 15... | 1300 | 6000 | 300 | 0 | 100 | 0 | 0 | -- | 1 | 1 | 4 | 40 |
| MAY | | | | | | | | | | | | |
| 19... | 1200 | 31000 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 |
| JUNE | | | | | | | | | | | | |
| 10... | 1030 | 62000 | 300 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 60 |
| JULY | | | | | | | | | | | | |
| 14... | 1200 | 26800 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 20 |
| AUG. | | | | | | | | | | | | |
| 11... | 1100 | 14300 | 100 | 0 | 600 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |
| SEP. | | | | | | | | | | | | |
| 08... | 1230 | 7100 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL COBALT (CO) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| MAY | | | | | | | | | | |
| 19... | 1200 | 31000 | 2 | 1 | <10 | 810 | 9 | 30 | .5 | 30 |
| JUNE | | | | | | | | | | |
| 10... | 1030 | 62000 | 2 | 4 | <10 | 2600 | 29 | 130 | -- | <10 |
| JULY | | | | | | | | | | |
| 14... | 1200 | 26800 | <1 | 1 | <10 | 420 | <1 | 20 | <.5 | 10 |
| AUG. | | | | | | | | | | |
| 11... | 1100 | 14300 | <1 | 1 | <10 | 30 | 3 | <10 | <.5 | <10 |
| SEP. | | | | | | | | | | |
| 08... | 1230 | 7100 | <1 | <1 | <10 | 220 | 3 | 10 | <.5 | 10 |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.--Continued

EXTREMES.--Continued

Period of record:
Water temperatures: Maximum, 21.5°C Aug. 6, 1970; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 1,200 mg/l June 5, 1968; minimum daily, 1 mg/l Apr. 13, 1968, Oct. 15, 1969.
Sediment discharge: Maximum daily, 200,000 tons June 5, 1968; minimum daily, 8.1 tons Jan. 3, 4, 1970.

REMARKS.--Recorder removed Nov. 9 to Mar. 12. Thermograph records furnished by Corps of Engineers, U.S. Army. Records of discharge are given for station 12301850, Kootenai River at Warland Bridge, near Libby. Flow affected by ice Nov. 22 to Jan. 31, Feb. 3-10, 17, 18, Mar. 1, 2.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | COLOR (PLAT-INUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | ORGANIC NITRO-GEN (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | CARBON DIOXIDE (CO2) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 2130 | 160 | 2 | .2 | .020 | .06 | .18 | .48 | .21 | .02 | 3.0 | 6.9 |
| NOV. | | | | | | | | | | | | |
| 16... | 2060 | 160 | 2 | .3 | .020 | .07 | .15 | .76 | .27 | .00 | 16 | 5.6 |
| DEC. | | | | | | | | | | | | |
| 07... | 1710 | 170 | 3 | .3 | .020 | .20 | .11 | 1.2 | .35 | .00 | 2.0 | 16 |
| JAN. | | | | | | | | | | | | |
| 19... | 1430 | 180 | 2 | -- | .000 | .00 | .00 | .00 | -- | .00 | 4.0 | 15 |
| FEB. | | | | | | | | | | | | |
| 19... | 2620 | 150 | 1 | -- | .010 | .01 | .00 | .30 | .23 | .00 | .0 | 2.7 |
| MAR. | | | | | | | | | | | | |
| 18... | 1890 | 170 | 0 | -- | .000 | .36 | .07 | .50 | .26 | .00 | 5.0 | 1.4 |
| APR. | | | | | | | | | | | | |
| 15... | 3050 | 150 | 5 | .1 | .000 | .23 | .24 | .15 | .10 | .00 | 7.0 | 1.8 |
| MAY | | | | | | | | | | | | |
| 19... | 10000 | 100 | 10 | .1 | .000 | .04 | .18 | .43 | .25 | .00 | 18 | 3.6 |
| JUNE | | | | | | | | | | | | |
| 10... | 20400 | 91 | 20 | .1 | .000 | .06 | -- | .12 | .20 | .00 | 6.0 | 2.7 |
| JULY | | | | | | | | | | | | |
| 14... | 8540 | 96 | 4 | .00 | .000 | .07 | -- | .03 | .050 | .00 | 5.0 | 1.6 |
| AUG. | | | | | | | | | | | | |
| 11... | 5100 | 110 | 5 | .00 | .000 | .25 | -- | .03 | .080 | .00 | .0 | 1.1 |
| SEP. | | | | | | | | | | | | |
| 08... | 2880 | 130 | 10 | .00 | .000 | .08 | .16 | .09 | .11 | .00 | 3.0 | 1.4 |

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED LITHIUM (LI) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 22... | 0 | 10 | 12 | 28 | .0 | 3 | 0 | 1 | 220 | .1 | 30 |
| NOV. | | | | | | | | | | | |
| 16... | 0 | 0 | 12 | 20 | .2 | 0 | 2 | 1 | 220 | .0 | 30 |
| DEC. | | | | | | | | | | | |
| 07... | 0 | 10 | 13 | 57 | .4 | 2 | 0 | 1 | 170 | .5 | 40 |
| JAN. | | | | | | | | | | | |
| 19... | 0 | 0 | 14 | 0 | .0 | 0 | 3 | 0 | 180 | .0 | 60 |
| FEB. | | | | | | | | | | | |
| 19... | 5 | 0 | 12 | 250 | .1 | 0 | 3 | 1 | 210 | .7 | 30 |
| MAR. | | | | | | | | | | | |
| 18... | 6 | 0 | 13 | 43 | .1 | 0 | 2 | 0 | 290 | .7 | 28 |
| APR. | | | | | | | | | | | |
| 15... | 0 | 4 | 12 | 20 | .2 | 3 | 0 | 1 | 280 | .0 | 30 |
| MAY | | | | | | | | | | | |
| 19... | 1 | 2 | 7.9 | 0 | .1 | 1 | 0 | 0 | 80 | .6 | 40 |
| JUNE | | | | | | | | | | | |
| 10... | 4 | 0 | 6.4 | 50 | .0 | 1 | 0 | 0 | 160 | .0 | 0 |
| JULY | | | | | | | | | | | |
| 14... | 0 | 22 | 7.2 | 49 | .1 | 0 | 2 | 0 | 40 | .0 | 7 |
| AUG. | | | | | | | | | | | |
| 11... | 2 | 11 | 8.7 | 20 | .0 | 0 | 1 | 0 | 90 | .7 | 0 |
| SEP. | | | | | | | | | | | |
| 08... | 0 | 5 | 10 | 20 | .1 | 3 | 4 | 0 | 210 | .0 | 30 |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | TURBIDITY (JTU) |
|---|---|---|---|---|---|---|---|---|
| OCT. 22... | 1430 | 6.0 | -- | 345 | 11.2 | 7.5 | 113 | 2 |
| NOV. 16... | 1245 | 3.5 | 4.5 | 355 | 12.3 | 7.6 | 116 | 2 |
| DEC. 07... | 1530 | .0 | 1.0 | 190 | 13.7 | 7.2 | 128 | 1 |
| JAN. 19... | 0930 | .0 | 2.0 | 240 | 11.7 | 7.2 | 121 | 1 |
| FEB. 19... | 1300 | .5 | 3.5 | 290 | 12.7 | 7.9 | 112 | 15 |
| MAR. 18... | 1000 | 2.0 | .0 | 360 | 12.5 | 8.2 | 116 | 2 |
| APR. 15... | 1300 | 8.0 | 9.0 | 315 | 11.8 | 8.1 | 115 | 5 |
| MAY 19... | 1200 | 7.5 | 9.0 | 230 | 12.6 | 7.7 | 92 | 25 |
| JUNE 10... | 1030 | 8.5 | 11.5 | 195 | 12.4 | 7.8 | 89 | 75 |
| JULY 14... | 1200 | 12.5 | 24.5 | 210 | 10.8 | 8.0 | 84 | 15 |
| AUG. 11... | 1100 | 19.0 | 32.0 | 240 | 10.2 | 8.2 | 94 | 2 |
| SEP. 08... | 1230 | 12.5 | 16.0 | 290 | 10.8 | 8.2 | 106 | 10 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (ONCE-DAILY RECORD)

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | --- | --- | 0.0 | 0.0 | 1.5 | 0.0 | --- | --- | --- | --- | --- | --- |
| 2 | --- | --- | 0.0 | 0.0 | 2.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 3 | --- | --- | 0.0 | 0.0 | 0.0 | 0.5 | --- | --- | --- | --- | --- | --- |
| 4 | --- | --- | 0.0 | 0.0 | 0.0 | 1.0 | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | 0.0 | 0.0 | 0.0 | 1.5 | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- |
| 7 | --- | --- | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- |
| 8 | --- | --- | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- |
| 9 | --- | 4.0 | 0.0 | 0.0 | 0.0 | 2.5 | --- | --- | --- | --- | --- | --- |
| 10 | --- | 4.0 | 0.0 | 0.0 | 0.0 | 3.0 | --- | --- | --- | --- | --- | --- |
| 11 | --- | 4.0 | 0.0 | 0.0 | 1.5 | 4.0 | --- | --- | --- | --- | --- | --- |
| 12 | --- | 4.0 | 0.0 | 0.0 | 1.5 | 4.0 | --- | --- | --- | --- | --- | --- |
| 13 | --- | 4.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 14 | --- | 4.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 15 | --- | 4.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 16 | --- | 4.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 17 | --- | 4.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- |
| 18 | --- | 4.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- |
| 19 | --- | 4.0 | 0.0 | 0.0 | 0.5 | --- | --- | --- | --- | --- | --- | --- |
| 20 | --- | 3.5 | 0.0 | 0.0 | 0.5 | --- | --- | --- | --- | --- | --- | --- |
| 21 | --- | 3.5 | 0.0 | 0.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| 22 | --- | 0.0 | 0.0 | 0.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| 23 | --- | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 24 | --- | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- |
| 25 | --- | 0.0 | 0.0 | 0.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| 26 | --- | 0.0 | 0.0 | 0.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| 27 | --- | 0.0 | 0.0 | 0.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- |
| 28 | --- | 0.0 | 0.0 | 0.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- |
| 29 | --- | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | --- | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | --- | --- | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| MONTH | --- | --- | 0.0 | 0.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- |
| YEAR | 1.0 | | | | | | | | | | | |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971 (THERMOGRAPH RECORD)

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 12.0 | 10.5 | 4.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 12.0 | 11.0 | 4.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | 12.0 | 10.5 | 4.5 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 12.0 | 11.0 | 4.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 13.0 | 10.5 | 4.0 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 11.5 | 9.0 | 4.5 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 10.0 | 8.0 | 4.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 9.0 | 7.0 | 5.0 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 9.0 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 9.0 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 9.5 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 9.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 4.0 |
| 14 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.5 |
| 15 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.5 |
| 16 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.5 |
| 17 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 3.0 |
| 18 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 3.0 |
| 19 | 8.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 3.0 |
| 20 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.5 |
| 21 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 3.0 |
| 22 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 2.0 |
| 23 | 8.5 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 3.0 | 1.5 |
| 24 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 2.0 |
| 25 | 8.0 | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 26 | 6.0 | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 4.5 |
| 27 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 4.5 |
| 28 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 4.5 |
| 29 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 4.5 |
| 30 | 5.0 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 5.0 |
| 31 | 4.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 6.0 | 5.5 |
| MONTH | 13.0 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.0 | 5.0 | 9.5 | 8.0 | 9.5 | 7.0 | 13.0 | 11.5 | 19.0 | 17.0 | 17.0 | 15.0 |
| 2 | 6.5 | 5.5 | 10.0 | 9.0 | 9.5 | 7.0 | 13.0 | 12.0 | 20.0 | 18.0 | 15.5 | 14.0 |
| 3 | 6.5 | 5.5 | 10.5 | 9.0 | 10.0 | 8.0 | 13.0 | 11.5 | 20.0 | 19.0 | 14.5 | 13.5 |
| 4 | 7.0 | 6.0 | 10.0 | 8.5 | 10.0 | 9.0 | 12.0 | 11.5 | 19.5 | 18.5 | 14.0 | 13.0 |
| 5 | 8.5 | 6.5 | 9.0 | 7.0 | 9.5 | 8.0 | 12.0 | 10.5 | 19.5 | 18.5 | 14.5 | 13.0 |
| 6 | 8.5 | 8.0 | 8.0 | 6.5 | 8.5 | 7.0 | 11.0 | 9.5 | 19.0 | 18.5 | 14.5 | 14.0 |
| 7 | 8.5 | 8.0 | 8.0 | 6.5 | 9.5 | 8.0 | 11.0 | 9.0 | 19.0 | 18.0 | 14.5 | 13.0 |
| 8 | 9.0 | 8.0 | 8.5 | 6.5 | 10.0 | 8.5 | 11.5 | 10.5 | 19.5 | 18.5 | 14.0 | 13.0 |
| 9 | 9.0 | 8.0 | 8.5 | 7.0 | 10.0 | 8.5 | 13.0 | 11.0 | 19.5 | 19.0 | 14.0 | 13.5 |
| 10 | 8.5 | 7.0 | 9.0 | 7.0 | 9.5 | 8.0 | 13.5 | 12.0 | 19.5 | 19.0 | 14.0 | 13.5 |
| 11 | 8.0 | 6.0 | 9.5 | 8.0 | 9.5 | 8.5 | 13.5 | 11.0 | 19.5 | 19.0 | 14.5 | 13.5 |
| 12 | 7.0 | 5.5 | 10.0 | 8.0 | 10.5 | 9.0 | 13.0 | 11.0 | 19.5 | 19.0 | 14.5 | 13.5 |
| 13 | 8.0 | 6.0 | 10.0 | 8.0 | 11.0 | 10.0 | 13.0 | 11.5 | 19.5 | 19.0 | 14.0 | 13.5 |
| 14 | 8.5 | 6.5 | 9.0 | 6.0 | 11.0 | 9.5 | 14.0 | 12.0 | 19.5 | 18.5 | 14.0 | 13.0 |
| 15 | 8.5 | 8.0 | 6.5 | 5.5 | 10.0 | 9.0 | 14.5 | 13.5 | 19.0 | 18.0 | 14.0 | 11.5 |
| 16 | 9.0 | 8.0 | 6.5 | 5.5 | 10.0 | 8.5 | 15.0 | 14.0 | 18.5 | 18.0 | 13.0 | 11.5 |
| 17 | 8.5 | 6.5 | 7.0 | 5.5 | 10.0 | 9.0 | 16.0 | 14.5 | 18.5 | 17.0 | 12.0 | 10.5 |
| 18 | 8.0 | 6.0 | 8.0 | 6.0 | 10.5 | 9.5 | 16.0 | 15.0 | 18.0 | 17.0 | 11.5 | 10.5 |
| 19 | 9.0 | 6.5 | 8.5 | 7.0 | 11.0 | 10.0 | 16.0 | 15.5 | 18.0 | 17.0 | 11.0 | 10.5 |
| 20 | 9.0 | 8.0 | 8.5 | 7.0 | 11.5 | 10.0 | 16.5 | 15.5 | 18.0 | 17.0 | 11.0 | 10.5 |
| 21 | 9.0 | 8.0 | 8.0 | 6.5 | 13.5 | 10.5 | 16.0 | 15.5 | 18.0 | 17.0 | 11.0 | 10.0 |
| 22 | 9.0 | 8.0 | 9.5 | 6.5 | 14.0 | 12.0 | 16.5 | 15.5 | 18.0 | 16.5 | 11.0 | 10.0 |
| 23 | 9.0 | 8.0 | 10.5 | 9.0 | 14.0 | 11.5 | 17.0 | 15.5 | 17.0 | 16.0 | 11.0 | 10.5 |
| 24 | 9.0 | 8.0 | 11.5 | 10.0 | 13.0 | 11.0 | 17.0 | 16.0 | 16.5 | 15.5 | 11.5 | 10.5 |
| 25 | 9.0 | 8.0 | 10.5 | 10.0 | 12.0 | 10.5 | 17.0 | 16.0 | 16.5 | 15.5 | 11.5 | 11.0 |
| 26 | 8.5 | 7.0 | 10.5 | 9.0 | 11.5 | 10.5 | 17.0 | 15.5 | 17.0 | 16.0 | 11.5 | 10.5 |
| 27 | 8.0 | 7.0 | 10.5 | 9.0 | 11.0 | 10.0 | 16.5 | 15.5 | 18.0 | 16.5 | 11.0 | 10.0 |
| 28 | 8.0 | 6.5 | 10.5 | 9.0 | 10.5 | 9.5 | 16.5 | 16.0 | 18.0 | 17.0 | 10.5 | 10.0 |
| 29 | 8.0 | 6.5 | 10.0 | 8.5 | 10.5 | 10.0 | 16.5 | 15.5 | 18.5 | 17.0 | 10.5 | 10.0 |
| 30 | 9.0 | 7.0 | 9.5 | 8.0 | 13.0 | 10.0 | 17.0 | 15.5 | 18.5 | 18.0 | 10.5 | 9.0 |
| 31 | --- | --- | 9.0 | 8.0 | --- | --- | 18.5 | 16.0 | 18.5 | 16.5 | --- | --- |
| MONTH | 9.0 | 5.0 | 11.5 | 5.5 | 14.0 | 7.0 | 18.5 | 9.0 | 20.0 | 15.5 | 17.0 | 9.0 |
| YEAR | 20.0 | 1.5 | | | | | | | | | | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 to SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MAY | | | | | | | | | | | |
| 14... | 1800 | 7.0 | 58000 | 683 | 107000 | 18 | 47 | 87 | 94 | 99 | 100 |
| JUNE | | | | | | | | | | | |
| 01... | 1330 | 9.0 | 57000 | 199 | 30600 | 19 | 46 | 85 | 94 | 99 | 100 |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 5060 | 8 | 109 | 3730 | 4 | 40 | 2900 | 17 | 133 |
| 2 | 5030 | 5 | 68 | 3760 | 2 | 20 | 3000 | 22 | 178 |
| 3 | 5000 | 8 | 108 | 3760 | 2 | 20 | 3100 | 28 | 234 |
| 4 | 4940 | 5 | 67 | 3730 | 3 | 30 | 3000 | 17 | 138 |
| 5 | 4910 | 5 | 66 | 3640 | 2 | 20 | 2900 | 22 | 172 |
| 6 | 4880 | 5 | 66 | 3700 | 2 | 20 | 2800 | 20 | 151 |
| 7 | 4970 | 5 | 67 | 3700 | 3 | 30 | 3400 | 18 | 165 |
| 8 | 5190 | 6 | 84 | 3730 | 3 | 30 | 3900 | 30 | 316 |
| 9 | 5120 | 6 | 83 | 3810 | 4 | 41 | 4000 | 10 | 108 |
| 10 | 5030 | 4 | 54 | 3870 | 4 | 42 | 3700 | 4 | 40 |
| 11 | 4940 | 4 | 53 | 3870 | 4 | 42 | 3500 | 9 | 85 |
| 12 | 4810 | 5 | 65 | 3840 | 3 | 31 | 3300 | 4 | 36 |
| 13 | 4720 | 11 | 140 | 3780 | 4 | 41 | 3100 | 4 | 33 |
| 14 | 4660 | 11 | 138 | 3730 | 8 | 81 | 3000 | 6 | 49 |
| 15 | 4570 | 10 | 123 | 3670 | 3 | 30 | 3100 | 6 | 50 |
| 16 | 4450 | 11 | 132 | 3640 | 4 | 39 | 3200 | 10 | 86 |
| 17 | 4450 | 7 | 84 | 3640 | 5 | 49 | 3300 | 10 | 89 |
| 18 | 4450 | 7 | 84 | 3670 | 4 | 40 | 3400 | 13 | 119 |
| 19 | 4190 | 7 | 79 | 3640 | 4 | 39 | 3300 | 5 | 45 |
| 20 | 4190 | 6 | 68 | 3620 | 5 | 49 | 3000 | 12 | 97 |
| 21 | 4220 | 6 | 68 | 3620 | 3 | 29 | 2800 | 17 | 129 |
| 22 | 4220 | 6 | 68 | 3100 | 2 | 17 | 2400 | 17 | 110 |
| 23 | 4250 | 4 | 46 | 2300 | 3 | 19 | 1900 | 21 | 108 |
| 24 | 4250 | 5 | 57 | 1900 | 3 | 15 | 1600 | 6 | 26 |
| 25 | 4300 | 4 | 46 | 2300 | 5 | 31 | 1300 | 4 | 14 |
| 26 | 4250 | 5 | 57 | 3000 | 11 | 89 | 1600 | 8 | 35 |
| 27 | 4190 | 4 | 45 | 2900 | 8 | 63 | 1900 | 5 | 26 |
| 28 | 4070 | 4 | 44 | 2700 | 6 | 44 | 2200 | 11 | 65 |
| 29 | 3960 | 4 | 43 | 2500 | 2 | 14 | 2500 | 10 | 68 |
| 30 | 3840 | 3 | 31 | 2700 | 4 | 29 | 2800 | 8 | 60 |
| 31 | 3780 | 3 | 31 | -- | -- | -- | 3000 | 30 | 243 |
| TOTAL | 140890 | -- | 2274 | 101550 | -- | 1084 | 88900 | -- | 3208 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 2900 | 10 | 78 | 7000 | 32 | 605 | 3260 | 6 | 53 |
| 2 | 2600 | 5 | 35 | 6600 | 17 | 303 | 3130 | 8 | 68 |
| 3 | 2200 | 7 | 42 | 6200 | 16 | 268 | 3180 | 8 | 69 |
| 4 | 1900 | 7 | 36 | 5600 | 21 | 318 | 3160 | 6 | 51 |
| 5 | 1600 | 11 | 48 | 5000 | 32 | 432 | 3050 | 4 | 33 |
| 6 | 1400 | 8 | 30 | 4000 | 14 | 151 | 2920 | 5 | 39 |
| 7 | 1600 | 3 | 13 | 3000 | 7 | 57 | 2920 | 15 | 118 |
| 8 | 1700 | 4 | 18 | 2700 | 6 | 44 | 2970 | 8 | 64 |
| 9 | 1800 | 6 | 29 | 2500 | 8 | 54 | 2970 | 4 | 32 |
| 10 | 1900 | 12 | 62 | 3000 | 6 | 49 | 2970 | 6 | 48 |
| 11 | 1800 | 10 | 49 | 3500 | 10 | 95 | 2990 | 8 | 65 |
| 12 | 1700 | 6 | 28 | 4000 | 16 | 173 | 3070 | 7 | 58 |
| 13 | 1600 | 7 | 30 | 4500 | 17 | 207 | 3070 | 7 | 58 |
| 14 | 1700 | 12 | 55 | 5000 | 22 | 297 | 3020 | 4 | 33 |
| 15 | 1900 | 14 | 72 | 5500 | 37 | 549 | 2990 | 5 | 40 |
| 16 | 2100 | 11 | 62 | 6000 | 33 | 535 | 2940 | 5 | 40 |
| 17 | 2300 | 13 | 81 | 5600 | 29 | 438 | 2890 | 4 | 31 |
| 18 | 2600 | 20 | 140 | 5300 | 34 | 487 | 2840 | 3 | 23 |
| 19 | 2900 | 15 | 117 | 5000 | 28 | 378 | 2760 | 2 | 15 |
| 20 | 3400 | 8 | 73 | 4570 | 26 | 321 | 2710 | 4 | 29 |
| 21 | 3900 | 7 | 74 | 4190 | 21 | 238 | 2760 | 2 | 15 |
| 22 | 4100 | 7 | 77 | 3960 | 17 | 182 | 2740 | 2 | 15 |
| 23 | 4000 | 7 | 76 | 3780 | 14 | 143 | 2710 | 3 | 22 |
| 24 | 3900 | 9 | 95 | 3780 | 13 | 133 | 2690 | 4 | 29 |
| 25 | 3900 | 4 | 42 | 3810 | 10 | 103 | 2810 | 7 | 53 |
| 26 | 3800 | 6 | 62 | 3760 | 11 | 112 | 2890 | 7 | 55 |
| 27 | 3800 | 7 | 72 | 3590 | 10 | 97 | 2990 | 6 | 48 |
| 28 | 3700 | 14 | 140 | 3400 | 7 | 64 | 2940 | 5 | 40 |
| 29 | 3700 | 13 | 130 | -- | -- | -- | 2890 | 7 | 55 |
| 30 | 4500 | 16 | 194 | -- | -- | -- | 2970 | 5 | 40 |
| 31 | 6000 | 12 | 194 | -- | -- | -- | 3210 | 10 | 87 |
| TOTAL | 86900 | -- | 2254 | 124840 | -- | 6833 | 91410 | -- | 1426 |

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 3320 | 9 | 81 | 14700 | 37 | 1470 | 57000 | 193 | 29700 |
| 2 | 3260 | 11 | 97 | 16200 | 75 | 3280 | 53000 | 165 | 23600 |
| 3 | 3240 | 15 | 131 | 19600 | 136 | 7200 | 53000 | 146 | 20900 |
| 4 | 3240 | 8 | 70 | 25200 | 241 | 16400 | 55000 | 137 | 20300 |
| 5 | 3290 | 15 | 133 | 32100 | 329 | 28500 | 58000 | 169 | 26500 |
| 6 | 3430 | 23 | 213 | 37200 | 382 | 38400 | 61000 | 294 | 48400 |
| 7 | 3810 | 26 | 267 | 37600 | 260 | 26400 | 62000 | 257 | 43000 |
| 8 | 4480 | 27 | 327 | 36800 | 190 | 18900 | 63000 | 247 | 42000 |
| 9 | 4910 | 29 | 384 | 38000 | 171 | 17500 | 64000 | 241 | 41600 |
| 10 | 5560 | 46 | 691 | 40600 | 202 | 22100 | 58000 | 219 | 34300 |
| 11 | 6120 | 57 | 942 | 41800 | 211 | 23800 | 52000 | 165 | 23200 |
| 12 | 5920 | 20 | 320 | 44900 | 235 | 28500 | 44800 | 111 | 13400 |
| 13 | 5500 | 20 | 297 | 52000 | 390 | 54800 | 43400 | 95 | 11100 |
| 14 | 5340 | 21 | 303 | 58000 | 653 | 102000 | 46400 | 104 | 13000 |
| 15 | 5600 | 28 | 423 | 53000 | 444 | 63500 | 47800 | 118 | 15200 |
| 16 | 6350 | 30 | 514 | 45000 | 232 | 28200 | 42400 | 96 | 11000 |
| 17 | 6590 | 28 | 498 | 37200 | 128 | 12900 | 36800 | 88 | 8740 |
| 18 | 6490 | 30 | 526 | 31600 | 108 | 9210 | 33600 | 71 | 6440 |
| 19 | 6250 | 19 | 321 | 27900 | 73 | 5500 | 32300 | 57 | 4970 |
| 20 | 6390 | 34 | 587 | 25800 | 61 | 4250 | 32400 | 51 | 4460 |
| 21 | 7500 | 47 | 952 | 25200 | 54 | 3670 | 34600 | 60 | 5610 |
| 22 | 9030 | 77 | 1880 | 24500 | 53 | 3510 | 38800 | 83 | 8700 |
| 23 | 10500 | 113 | 3200 | 25100 | 64 | 4340 | 44600 | 116 | 14000 |
| 24 | 12600 | 142 | 4830 | 28200 | 88 | 6700 | 50000 | 152 | 20500 |
| 25 | 15500 | 196 | 8200 | 34800 | 165 | 15500 | 53000 | 197 | 28200 |
| 26 | 17900 | 264 | 12800 | 45000 | 307 | 37300 | 52000 | 243 | 34100 |
| 27 | 17200 | 101 | 4690 | 54000 | 326 | 47500 | 47100 | 168 | 21400 |
| 28 | 16300 | 53 | 2330 | 64000 | 373 | 64500 | 39200 | 103 | 10900 |
| 29 | 15200 | 52 | 2130 | 67000 | 692 | 125000 | 33500 | 72 | 6510 |
| 30 | 14600 | 32 | 1260 | 63000 | 446 | 75900 | 30300 | 60 | 4910 |
| 31 | -- | -- | -- | 60000 | 290 | 47000 | -- | -- | -- |
| TOTAL | 235420 | -- | 49397 | 1206000 | -- | 943730 | 1419000 | -- | 596640 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 29900 | 55 | 4440 | 17300 | 48 | 2240 | 8100 | 17 | 372 |
| 2 | 30000 | 59 | 4780 | 17400 | 35 | 1640 | 8500 | 12 | 275 |
| 3 | 29800 | 51 | 4100 | 18000 | 15 | 729 | 8570 | 12 | 278 |
| 4 | 28900 | 48 | 3750 | 17500 | 11 | 520 | 8350 | 16 | 361 |
| 5 | 27000 | 60 | 4370 | 17000 | 14 | 643 | 7940 | 14 | 300 |
| 6 | 25300 | 54 | 3690 | 16500 | 12 | 535 | 7610 | 23 | 473 |
| 7 | 24400 | 52 | 3430 | 16000 | 12 | 518 | 7400 | 7 | 140 |
| 8 | 22700 | 43 | 2640 | 15500 | 8 | 335 | 7500 | 10 | 203 |
| 9 | 21000 | 81 | 4590 | 15000 | 12 | 486 | 7830 | 15 | 317 |
| 10 | 20800 | 43 | 2410 | 14500 | 8 | 313 | 7500 | 17 | 344 |
| 11 | 24900 | 36 | 2420 | 14000 | 11 | 416 | 7120 | 18 | 346 |
| 12 | 28500 | 61 | 4690 | 12900 | 8 | 279 | 7080 | 10 | 191 |
| 13 | 27700 | 43 | 3220 | 12100 | 5 | 163 | 6910 | 10 | 187 |
| 14 | 25300 | 38 | 2600 | 11600 | 7 | 219 | 6940 | 11 | 206 |
| 15 | 24300 | 40 | 2620 | 11100 | 8 | 240 | 6630 | 9 | 161 |
| 16 | 24600 | 41 | 2720 | 10600 | 8 | 229 | 6350 | 7 | 120 |
| 17 | 25800 | 55 | 3830 | 10100 | 6 | 164 | 6090 | 5 | 82 |
| 18 | 27200 | 67 | 4920 | 9610 | 7 | 182 | 5960 | 10 | 161 |
| 19 | 26800 | 48 | 3470 | 9220 | 7 | 174 | 5830 | 10 | 157 |
| 20 | 26800 | 48 | 3470 | 9200 | 8 | 199 | 5730 | 8 | 124 |
| 21 | 27700 | 44 | 3290 | 8800 | 14 | 333 | 5660 | 7 | 107 |
| 22 | 27800 | 40 | 3000 | 8600 | 13 | 302 | 5530 | 10 | 149 |
| 23 | 27300 | 40 | 2950 | 8600 | 9 | 209 | 5440 | 12 | 176 |
| 24 | 26500 | 36 | 2580 | 8800 | 10 | 238 | 5280 | 15 | 214 |
| 25 | 25800 | 32 | 2230 | 8700 | 8 | 188 | 5120 | 11 | 152 |
| 26 | 23700 | 25 | 1600 | 8300 | 10 | 224 | 5060 | 10 | 137 |
| 27 | 20900 | 26 | 1470 | 8000 | 12 | 259 | 5000 | 9 | 122 |
| 28 | 19500 | 29 | 1530 | 7600 | 9 | 185 | 4970 | 8 | 107 |
| 29 | 19000 | 33 | 1690 | 7400 | 13 | 260 | 5060 | 13 | 178 |
| 30 | 18600 | 28 | 1410 | 7500 | 22 | 446 | 5060 | 10 | 137 |
| 31 | 17700 | 26 | 1240 | 7700 | 20 | 416 | -- | -- | -- |
| TOTAL | 776200 | -- | 95150 | 365130 | -- | 13284 | 196120 | -- | 6277 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 4832360
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 1721557

## 12302055 FISHER RIVER NEAR LIBBY, MONT.

LOCATION.--Lat 48°21'02", long 115°18'40", in SE¼SE¼NW¼ sec.21, T.30 N., R.29 W., Lincoln County, at bridge 0.2 mile upstream from gaging station, 1 mile upstream from mouth, and 11.6 miles east of Libby.

DRAINAGE AREA.--838 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1971.
Water temperatures: September 1967 to September 1971.
Sediment records: September 1967 to September 1971.

EXTREMES.--1970-71:
Water temperatures: Maximum, 24.0°C Aug. 5; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 1,710 mg/l Jan. 31; minimum daily, 1 mg/l on several days during November, December and September.
Sediment discharge: Maximum daily, 13,200 tons Jan. 31; minimum daily, 0.31 ton Nov. 6, 8.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | SILICA (SIO2) (MG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1145 | 124 | 11 | 26 | 3.6 | 1.0 | 7.5 | 2.1 | .1 | 0 | 126 | .17 |
| NOV. | | | | | | | | | | | | |
| 16... | 1130 | 122 | 11 | 25 | 3.6 | .8 | 6.5 | .7 | .2 | 50 | 124 | .17 |
| DEC. | | | | | | | | | | | | |
| 07... | 1300 | 250 | 10 | 20 | 3.0 | .8 | 5.6 | .9 | .1 | 0 | 98 | .13 |
| JAN. | | | | | | | | | | | | |
| 19... | 1100 | 260 | 9.3 | 20 | 2.7 | .6 | 6.2 | .9 | .1 | 10 | 89 | .12 |
| FEB. | | | | | | | | | | | | |
| 19... | 1015 | 970 | 12 | 13 | 2.6 | 1.1 | 4.5 | .6 | .2 | 20 | 92 | .13 |
| MAR. | | | | | | | | | | | | |
| 18... | 1130 | 338 | 12 | 23 | 3.3 | .9 | 12 | .5 | .0 | 90 | 124 | .17 |
| APR. | | | | | | | | | | | | |
| 15... | 0930 | 1480 | 14 | 15 | 3.2 | 1.4 | 7.0 | .5 | .3 | 30 | 60 | .08 |
| MAY | | | | | | | | | | | | |
| 19... | 1500 | 1830 | 12 | 11 | 2.1 | .8 | 2.8 | .8 | .1 | 0 | 54 | .07 |
| JUNE | | | | | | | | | | | | |
| 10... | 1330 | 1390 | 11 | 12 | 2.1 | .7 | 3.3 | .5 | .1 | 20 | 88 | .12 |
| JULY | | | | | | | | | | | | |
| 14... | 1330 | 611 | 11 | 17 | 2.6 | 1.1 | 13 | .6 | .1 | 10 | 90 | .12 |
| AUG. | | | | | | | | | | | | |
| 11... | 1300 | 234 | 9.4 | 23 | 3.1 | 1.0 | 4.5 | .4 | .2 | 0 | 116 | .16 |
| SEP. | | | | | | | | | | | | |
| 08... | 1000 | 180 | 12 | 26 | 3.6 | 1.0 | 5.0 | .3 | .1 | 10 | 120 | .16 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 1145 | 124 | 100 | 0 | 0 | 0 | 0 | -- | 0 | 0 | 0 | 20 |
| DEC. | | | | | | | | | | | | |
| 07... | 1300 | 250 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 19... | 1100 | 260 | 300 | 20 | 100 | 30 | 0 | -- | -- | 0 | 1 | 110 |
| FEB. | | | | | | | | | | | | |
| 19... | 1015 | 970 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 18... | 1130 | 338 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 15... | 0930 | 1480 | 400 | 10 | 200 | 7 | 0 | -- | 0 | 2 | 2 | 100 |
| MAY | | | | | | | | | | | | |
| 19... | 1500 | 1830 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 10... | 1330 | 1390 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 14... | 1330 | 611 | 200 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 1 | 30 |
| AUG. | | | | | | | | | | | | |
| 11... | 1300 | 234 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SEP. | | | | | | | | | | | | |
| 08... | 1000 | 180 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

12302055 FISHER RIVER NEAR LIBBY, MONT.--Continued

EXTREMES.--Continued

Period of record:
Water temperatures: Maximum recorded, 24.0°C July 11, Aug. 3, 1968, Aug. 5, 1971; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 1,710 mg/l Jan. 31, 1971; minimum daily, 1 mg/l on several days in 1967, 1969-71.
Sediment discharge: Maximum daily, 13,200 tons Jan. 31, 1971; minimum daily, 0.30 ton Sept. 17, 22, 1967.

REMARKS.--Temperature recorder at gaging station 0.2 mile downstream from sampling site. Flow affected by ice during most of winter period. During periods of ice effect, sediment samples are taken in open channel.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | COLOR (PLAT-INUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | AMMONIA NITRO-GEN (N) (MG/L) | ORGANIC NITRO-GEN (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | TOTAL PHOS-PHORUS (P) (MG/L) | METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | CARBON DIOXIDE (CO2) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 22... | 42.2 | 110 | 1 | .00 | .000 | .02 | .15 | .05 | .020 | .00 | 10 | 5.4 |
| NOV. | | | | | | | | | | | | |
| 16... | 40.8 | 110 | 4 | .00 | .020 | .01 | .08 | .02 | .010 | .00 | 18 | 5.4 |
| DEC. | | | | | | | | | | | | |
| 07... | 66.1 | 78 | 1 | .00 | .000 | .01 | .11 | .07 | .020 | .00 | 86 | 8.0 |
| JAN. | | | | | | | | | | | | |
| 19... | 62.5 | 78 | 0 | -- | .020 | .00 | .03 | .72 | -- | -- | 3.0 | 17 |
| FEB. | | | | | | | | | | | | |
| 19... | 241 | 54 | 10 | -- | .000 | .02 | .01 | .05 | .070 | .02 | 2.0 | 10 |
| MAR. | | | | | | | | | | | | |
| 18... | 113 | 90 | 0 | -- | .000 | .31 | .02 | .05 | .030 | .00 | 5.0 | 1.3 |
| APR. | | | | | | | | | | | | |
| 15... | 240 | 59 | 20 | .1 | .000 | .25 | .44 | .09 | .070 | .00 | 8.0 | 5.5 |
| MAY | | | | | | | | | | | | |
| 19... | 267 | 43 | 20 | .00 | .000 | .02 | .25 | .06 | .070 | .00 | 37 | 1.1 |
| JUNE | | | | | | | | | | | | |
| 10... | 330 | 44 | 10 | .00 | .000 | .04 | .21 | .09 | .060 | .00 | 47 | 1.7 |
| JULY | | | | | | | | | | | | |
| 14... | 148 | 65 | 4 | .00 | .000 | .07 | -- | .03 | .020 | .00 | 6.0 | 2.4 |
| AUG. | | | | | | | | | | | | |
| 11... | 73.3 | 94 | 5 | .00 | .000 | .16 | -- | .03 | .040 | .00 | 1.0 | .9 |
| SEP. | | | | | | | | | | | | |
| 08... | 58.3 | 100 | 5 | .00 | .010 | .08 | -- | .00 | .040 | .00 | 71 | 14 |

| DATE | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED LITHIUM (LI) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED VANA-DIUM (V) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 22... | 0 | 0 | 10 | 13 | .2 | 0 | 0 | 0 | 200 | .0 | 10 |
| DEC. | | | | | | | | | | | |
| 07... | -- | -- | 6.9 | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | |
| 19... | 0 | 0 | 6.8 | 0 | -- | -- | 0 | 0 | 90 | 2.0 | 30 |
| FEB. | | | | | | | | | | | |
| 19... | -- | -- | 5.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | |
| 18... | -- | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | |
| 15... | 3 | 9 | 5.2 | 0 | .1 | 5 | 0 | 1 | 170 | .0 | 20 |
| MAY | | | | | | | | | | | |
| 19... | -- | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | |
| 10... | -- | -- | 3.6 | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | |
| 14... | 2 | 29 | 5.7 | 0 | .0 | 29 | 2 | 0 | 90 | .0 | 0 |
| AUG. | | | | | | | | | | | |
| 11... | -- | -- | 8.8 | -- | -- | -- | -- | -- | -- | -- | -- |
| SEP. | | | | | | | | | | | |
| 08... | -- | -- | 9.6 | -- | -- | -- | -- | -- | -- | -- | -- |

12302055 FISHER RIVER NEAR LIBBY, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | TURBIDITY (JTU) |
|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | |
| 22... | 1145 | 7.0 | -- | 270 | 11.0 | 7.6 | 110 | 0 |
| NOV. | | | | | | | | |
| 16... | 1130 | 3.5 | 3.5 | 200 | 12.3 | 7.6 | 110 | 1 |
| DEC. | | | | | | | | |
| 07... | 1300 | .0 | 1.5 | 150 | 12.9 | 7.3 | 82 | 3 |
| JAN. | | | | | | | | |
| 19... | 1100 | .0 | 2.0 | 180 | 12.7 | 6.9 | 67 | 1 |
| FEB. | | | | | | | | |
| 19... | 1015 | 1.5 | .0 | 145 | 12.3 | 7.0 | 53 | 15 |
| MAR. | | | | | | | | |
| 18... | 1130 | 1.0 | 4.0 | 175 | 13.1 | 8.1 | 84 | 3 |
| APR. | | | | | | | | |
| 15... | 0930 | 5.5 | 6.5 | 140 | 12.4 | 7.3 | 56 | 15 |
| MAY | | | | | | | | |
| 19... | 1500 | 7.5 | 10.0 | 115 | 12.4 | 7.9 | 46 | 20 |
| JUNE | | | | | | | | |
| 10... | 1330 | 10.0 | 19.5 | 105 | 11.2 | 7.7 | 43 | 10 |
| JULY | | | | | | | | |
| 14... | 1330 | 15.5 | 29.0 | 145 | 9.8 | 7.7 | 62 | 3 |
| AUG. | | | | | | | | |
| 11... | 1300 | 21.0 | 33.0 | 215 | 9.0 | 8.3 | 95 | 1 |
| SEP. | | | | | | | | |
| 08... | 1000 | 10.5 | 7.5 | 235 | 11.2 | 7.2 | 112 | 1 |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) | SUS. SED. FALL DIAM. % FINER THAN .004 MM | SUS. SED. FALL DIAM. % FINER THAN .016 MM | SUS. SED. FALL DIAM. % FINER THAN .062 MM | SUS. SED. FALL DIAM. % FINER THAN .125 MM | SUS. SED. FALL DIAM. % FINER THAN .250 MM | SUS. SED. FALL DIAM. % FINER THAN .500 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MAY | | | | | | | | | | | |
| 06... | 1500 | 6.5 | 3920 | 376 | 3980 | 18 | 45 | 84 | 92 | 97 | 100 |

12302055 FISHER RIVER NEAR LIBBY, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 12.5 | 8.5 | 3.5 | 1.5 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 2 | 12.5 | 9.0 | 3.0 | 2.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 3 | 12.5 | 9.0 | 2.5 | 1.5 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 4 | 12.5 | 9.0 | 2.0 | 1.0 | 0.0 | 0.0 | --- | --- | --- | --- | --- | --- |
| 5 | 12.0 | 10.0 | 4.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 6 | 10.0 | 8.5 | 5.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 7 | 8.5 | 6.5 | 4.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 8 | 7.0 | 6.5 | 4.5 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 9 | 8.5 | 7.0 | 5.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 10 | 9.0 | 7.5 | 5.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | --- |
| 11 | 9.0 | 8.0 | 5.0 | 4.0 | --- | --- | 0.0 | 0.0 | 1.5 | 0.0 | --- | --- |
| 12 | 10.0 | 8.0 | 5.0 | 4.0 | --- | --- | 0.0 | 0.0 | 2.0 | 1.5 | --- | --- |
| 13 | 8.5 | 6.5 | 5.0 | 4.0 | --- | --- | 0.0 | 0.0 | 2.5 | 2.0 | --- | --- |
| 14 | 7.5 | 5.0 | 4.0 | 3.0 | --- | --- | 0.0 | 0.0 | 2.5 | 2.0 | --- | --- |
| 15 | 7.0 | 4.5 | 3.5 | 3.0 | --- | --- | 0.0 | 0.0 | 2.5 | 2.5 | --- | --- |
| 16 | 7.0 | 4.0 | 4.0 | 3.0 | --- | --- | 0.0 | 0.0 | 2.5 | 2.0 | --- | --- |
| 17 | 7.0 | 4.0 | 4.5 | 4.0 | --- | --- | 0.0 | 0.0 | 2.0 | 1.0 | --- | --- |
| 18 | 7.0 | 4.5 | 4.5 | 4.0 | --- | --- | 0.0 | 0.0 | 1.5 | 1.0 | --- | --- |
| 19 | 9.0 | 6.5 | 4.0 | 3.5 | --- | --- | 0.0 | 0.0 | 2.0 | 1.5 | 3.5 | 1.0 |
| 20 | 7.5 | 7.0 | 3.5 | 2.0 | --- | --- | 0.0 | 0.0 | 2.0 | 1.5 | 3.0 | 1.0 |
| 21 | 7.5 | 7.0 | 2.0 | 0.5 | --- | --- | 0.0 | 0.0 | 1.5 | 0.0 | 3.5 | 0.5 |
| 22 | 7.5 | 7.0 | 0.5 | 0.0 | --- | --- | 0.0 | 0.0 | 1.5 | 1.0 | 2.5 | 1.0 |
| 23 | 7.5 | 7.0 | 0.0 | 0.0 | --- | --- | 0.0 | 0.0 | 2.0 | 1.5 | 2.0 | 0.0 |
| 24 | 7.5 | 7.0 | 0.0 | 0.0 | --- | --- | 0.0 | 0.0 | 2.0 | 2.0 | 5.0 | 2.0 |
| 25 | 7.0 | 5.0 | 0.0 | 0.0 | --- | --- | 0.0 | 0.0 | 2.0 | 1.5 | 5.0 | 2.5 |
| 26 | 5.0 | 3.0 | 0.0 | 0.0 | --- | --- | 0.0 | 0.0 | 1.5 | 0.5 | 4.0 | 2.0 |
| 27 | 4.0 | 2.0 | 0.0 | 0.0 | --- | --- | 0.5 | 0.0 | 0.5 | 0.0 | 3.0 | 2.0 |
| 28 | 4.0 | 2.5 | 0.0 | 0.0 | --- | --- | 1.0 | 0.0 | 0.5 | 0.0 | 3.0 | 2.0 |
| 29 | 4.0 | 2.0 | 0.0 | 0.0 | --- | --- | 2.0 | 1.0 | --- | --- | 4.0 | 3.0 |
| 30 | 3.0 | 2.0 | 0.0 | 0.0 | --- | --- | 2.0 | 0.5 | --- | --- | 4.5 | 3.0 |
| 31 | 3.0 | 1.5 | --- | --- | --- | --- | 0.5 | 0.5 | --- | --- | 4.0 | 3.0 |
| MONTH | 12.5 | 1.5 | 5.0 | 0.0 | --- | --- | 2.0 | 0.0 | --- | --- | --- | --- |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 4.0 | 2.0 | 7.5 | 5.0 | --- | --- | 14.5 | 12.0 | 23.0 | 17.5 | 15.5 | 13.5 |
| 2 | 4.0 | 3.0 | 8.5 | 6.0 | --- | --- | 14.5 | 12.5 | 23.0 | 18.5 | 13.5 | 12.5 |
| 3 | 4.0 | 2.0 | 9.0 | 6.5 | --- | --- | 14.5 | 11.5 | 23.0 | 19.0 | 14.0 | 12.5 |
| 4 | 4.5 | 2.5 | 9.0 | 7.0 | --- | --- | 14.5 | 12.0 | 23.0 | 18.0 | 15.0 | 12.0 |
| 5 | 5.0 | 3.0 | 7.5 | 7.0 | --- | --- | 14.0 | 12.5 | 24.0 | 18.0 | 17.5 | 12.0 |
| 6 | 5.0 | 3.5 | 7.0 | 6.0 | --- | --- | 13.0 | 12.0 | 21.0 | 19.0 | 16.0 | 12.5 |
| 7 | 5.0 | 4.0 | 8.5 | 5.5 | --- | --- | 14.5 | 10.5 | 23.0 | 17.5 | 14.5 | 9.5 |
| 8 | 5.0 | 3.0 | 9.0 | 7.0 | --- | --- | 14.5 | 12.0 | 23.5 | 18.0 | 16.0 | 10.0 |
| 9 | 5.0 | 4.0 | 9.0 | 7.0 | --- | --- | 17.0 | 13.0 | 23.0 | 18.0 | 14.5 | 11.5 |
| 10 | 4.5 | 4.0 | 9.5 | 7.0 | --- | --- | 16.0 | 14.0 | 22.5 | 17.0 | 16.5 | 11.0 |
| 11 | 4.0 | 3.0 | 10.0 | 7.0 | --- | --- | 14.0 | 12.0 | 23.0 | 17.0 | 17.0 | 13.0 |
| 12 | 5.0 | 3.0 | 10.0 | 7.5 | --- | --- | 14.5 | 11.5 | 22.5 | 17.0 | 16.0 | 11.0 |
| 13 | 5.0 | 3.0 | 10.0 | 8.0 | --- | --- | 16.0 | 12.0 | 22.0 | 16.0 | 15.0 | 11.0 |
| 14 | 5.0 | 4.0 | 8.5 | 6.5 | --- | --- | 17.0 | 13.0 | 21.5 | 16.5 | 13.5 | 9.0 |
| 15 | 6.0 | 5.0 | 7.5 | 6.0 | --- | --- | 18.0 | 13.5 | 21.0 | 15.0 | 14.0 | 8.5 |
| 16 | 5.5 | 4.0 | 8.5 | 7.0 | 12.0 | 10.0 | 19.0 | 14.5 | 20.5 | 15.0 | 12.0 | 9.5 |
| 17 | 5.0 | 4.0 | 8.0 | 7.0 | 12.0 | 10.5 | 19.5 | 15.0 | 20.0 | 14.5 | 13.0 | 7.5 |
| 18 | 6.0 | 4.0 | 7.5 | 7.0 | 12.0 | 11.0 | 20.0 | 15.5 | 20.0 | 14.0 | 12.5 | 7.5 |
| 19 | 6.5 | 4.0 | 7.5 | 7.0 | 12.5 | 10.0 | 20.5 | 16.0 | 21.0 | 15.0 | 12.5 | 8.5 |
| 20 | 6.5 | 4.5 | 7.5 | 6.5 | 12.5 | 10.5 | 21.0 | 16.0 | 19.0 | 15.0 | 12.5 | 9.5 |
| 21 | 6.0 | 5.0 | 8.5 | 6.5 | 14.5 | 10.5 | 21.0 | 16.5 | 20.0 | 14.0 | 12.0 | 7.0 |
| 22 | 6.0 | 5.0 | 10.5 | 7.0 | 16.0 | 13.0 | 21.5 | 17.0 | 18.0 | 15.0 | 12.5 | 7.5 |
| 23 | 6.0 | 5.5 | 10.5 | 8.0 | 15.5 | 13.0 | 21.5 | 17.0 | 17.0 | 13.0 | 13.0 | 8.0 |
| 24 | 6.0 | 5.5 | 11.0 | 8.5 | 13.5 | 11.0 | 20.5 | 16.5 | 19.0 | 13.0 | 13.0 | 9.0 |
| 25 | 6.5 | 5.0 | --- | --- | 13.5 | 13.0 | 21.5 | 16.5 | 20.0 | 14.0 | 11.5 | 9.5 |
| 26 | 6.0 | 4.5 | --- | --- | 13.0 | 10.0 | 21.0 | 16.0 | 20.5 | 14.0 | 10.5 | 8.5 |
| 27 | 5.0 | 4.5 | --- | --- | 12.5 | 11.0 | 21.0 | 16.5 | 21.0 | 15.0 | 10.0 | 8.0 |
| 28 | 6.0 | 5.0 | --- | --- | 12.0 | 9.5 | 20.0 | 17.5 | 20.0 | 16.0 | 10.5 | 9.0 |
| 29 | 6.5 | 5.0 | --- | --- | 11.0 | 8.0 | 20.5 | 15.0 | 20.5 | 15.5 | 10.0 | 8.5 |
| 30 | 6.5 | 4.5 | --- | --- | 14.0 | 10.5 | 21.5 | 16.0 | 19.0 | 17.0 | 9.5 | 7.5 |
| 31 | --- | --- | --- | --- | --- | --- | 22.5 | 17.0 | 17.5 | 15.5 | --- | --- |
| MONTH | 6.5 | 2.0 | --- | --- | --- | --- | 22.5 | 10.5 | 24.0 | 13.0 | 17.5 | 7.0 |
| YEAR | 24.0 | 0.0 | | | | | | | | | | |

12302055 FISHER RIVER NEAR LIBBY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 109 | 2 | .59 | 113 | 6 | 1.8 | 191 | 7 | 3.6 |
| 2 | 108 | 3 | .87 | 112 | 4 | 1.2 | 177 | 10 | 4.8 |
| 3 | 107 | 2 | .58 | 110 | 7 | 2.1 | 171 | 5 | 2.3 |
| 4 | 106 | 2 | .57 | 109 | 3 | .88 | 165 | 3 | 1.3 |
| 5 | 107 | 3 | .87 | 111 | 2 | .60 | 137 | 4 | 1.5 |
| 6 | 121 | 2 | .65 | 114 | 1 | .31 | 190 | 16 | 8.2 |
| 7 | 129 | 2 | .70 | 115 | 3 | .93 | 266 | 12 | 8.6 |
| 8 | 120 | 3 | .97 | 115 | 1 | .31 | 369 | 10 | 10 |
| 9 | 120 | 2 | .65 | 121 | 3 | .98 | 329 | 7 | 6.2 |
| 10 | 128 | 2 | .69 | 141 | 2 | .76 | 272 | 6 | 4.4 |
| 11 | 129 | 3 | 1.0 | 137 | 3 | 1.1 | 276 | 7 | 5.2 |
| 12 | 133 | 2 | .72 | 131 | 3 | 1.1 | 214 | 4 | 2.3 |
| 13 | 146 | 2 | .79 | 130 | 3 | 1.1 | 174 | 3 | 1.4 |
| 14 | 138 | 3 | 1.1 | 127 | 2 | .69 | 167 | 3 | 1.4 |
| 15 | 130 | 2 | .70 | 124 | 2 | .67 | 231 | 2 | 1.2 |
| 16 | 126 | 2 | .68 | 124 | 4 | 1.3 | 220 | 4 | 2.4 |
| 17 | 124 | 3 | 1.0 | 144 | 3 | 1.2 | 195 | 3 | 1.6 |
| 18 | 122 | 2 | .66 | 158 | 3 | 1.3 | 177 | 5 | 2.4 |
| 19 | 121 | 2 | .65 | 148 | 2 | .80 | 172 | 4 | 1.9 |
| 20 | 120 | 3 | .97 | 144 | 3 | 1.2 | 187 | 2 | 1.0 |
| 21 | 122 | 2 | .66 | 141 | 3 | 1.1 | 207 | 3 | 1.7 |
| 22 | 124 | 2 | .67 | 100 | 3 | .81 | 180 | 1 | .49 |
| 23 | 124 | 2 | .67 | 90 | 2 | .49 | 150 | 3 | 1.2 |
| 24 | 129 | 3 | 1.0 | 150 | 2 | .81 | 160 | 3 | 1.3 |
| 25 | 137 | 3 | 1.1 | 396 | 3 | 3.2 | 170 | 3 | 1.4 |
| 26 | 130 | 3 | 1.1 | 277 | 3 | 2.2 | 175 | 3 | 1.4 |
| 27 | 125 | 4 | 1.4 | 241 | 4 | 2.6 | 180 | 8 | 3.9 |
| 28 | 120 | 4 | 1.3 | 218 | 11 | 6.5 | 185 | 4 | 2.0 |
| 29 | 118 | 4 | 1.3 | 213 | 14 | 8.1 | 190 | 6 | 3.1 |
| 30 | 116 | 5 | 1.6 | 214 | 10 | 5.8 | 190 | 3 | 1.5 |
| 31 | 114 | 5 | 1.5 | -- | -- | -- | 180 | 3 | 1.5 |
| TOTAL | 3803 | -- | 27.71 | 4568 | -- | 51.94 | 6247 | -- | 91.19 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 160 | 4 | 1.7 | 2850 | 502 | 3860 | 490 | 14 | 19 |
| 2 | 130 | 4 | 1.4 | 2240 | 279 | 1690 | 510 | 14 | 19 |
| 3 | 110 | 4 | 1.2 | 1740 | 114 | 536 | 480 | 11 | 14 |
| 4 | 100 | 2 | .54 | 1400 | 125 | 473 | 450 | 11 | 13 |
| 5 | 90 | 2 | .49 | 1170 | 52 | 164 | 430 | 8 | 9.3 |
| 6 | 110 | 4 | 1.2 | 954 | 41 | 106 | 410 | 10 | 11 |
| 7 | 130 | 3 | 1.1 | 823 | 23 | 51 | 400 | 6 | 6.5 |
| 8 | 160 | 2 | .86 | 731 | 24 | 47 | 390 | 7 | 7.4 |
| 9 | 190 | 4 | 2.1 | 660 | 33 | 59 | 380 | 7 | 7.2 |
| 10 | 210 | 3 | 1.7 | 682 | 25 | 46 | 370 | 9 | 9.0 |
| 11 | 190 | 5 | 2.6 | 675 | 24 | 44 | 360 | 12 | 12 |
| 12 | 170 | 5 | 2.3 | 637 | 34 | 58 | 370 | 10 | 10 |
| 13 | 150 | 4 | 1.6 | 664 | 47 | 84 | 370 | 13 | 13 |
| 14 | 180 | 5 | 2.4 | 783 | 88 | 186 | 360 | 11 | 11 |
| 15 | 210 | 6 | 3.4 | 945 | 139 | 355 | 350 | 9 | 8.5 |
| 16 | 230 | 7 | 4.3 | 1080 | 86 | 251 | 340 | 8 | 7.3 |
| 17 | 250 | 8 | 5.4 | 1040 | 44 | 124 | 330 | 7 | 6.2 |
| 18 | 260 | 22 | 15 | 966 | 39 | 102 | 336 | 6 | 5.4 |
| 19 | 270 | 18 | 13 | 910 | 30 | 74 | 362 | 6 | 5.9 |
| 20 | 500 | 13 | 18 | 840 | 36 | 82 | 360 | 5 | 4.9 |
| 21 | 790 | 15 | 32 | 745 | 23 | 46 | 351 | 4 | 3.8 |
| 22 | 596 | 28 | 45 | 721 | 21 | 41 | 348 | 4 | 3.8 |
| 23 | 538 | 46 | 67 | 673 | 18 | 33 | 346 | 4 | 3.7 |
| 24 | 497 | 46 | 62 | 655 | 18 | 32 | 358 | 9 | 8.7 |
| 25 | 445 | 30 | 36 | 650 | 17 | 30 | 386 | 10 | 10 |
| 26 | 409 | 26 | 29 | 600 | 16 | 26 | 429 | 23 | 27 |
| 27 | 417 | 19 | 21 | 556 | 12 | 18 | 497 | 26 | 35 |
| 28 | 378 | 20 | 20 | 530 | 14 | 20 | 502 | 20 | 27 |
| 29 | 359 | 50 | 48 | -- | -- | -- | 513 | 22 | 30 |
| 30 | 726 | 240 | 470 | -- | -- | -- | 597 | 64 | 103 |
| 31 | 2860 | 1710 | 13200 | -- | -- | -- | 693 | 71 | 133 |
| TOTAL | 11815 | -- | 14110.29 | 26920 | -- | 8638 | 12868 | -- | 584.6 |

12302055 FISHER RIVER NEAR LIBBY, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 691 | 49 | 91 | 2280 | 63 | 388 | 2080 | 73 | 410 |
| 2 | 731 | 43 | 85 | 2490 | 144 | 968 | 1900 | 70 | 359 |
| 3 | 735 | 40 | 79 | 3220 | 360 | 3130 | 1780 | 54 | 260 |
| 4 | 750 | 32 | 65 | 3970 | 662 | 7100 | 1600 | 42 | 181 |
| 5 | 793 | 35 | 75 | 4480 | 836 | 10100 | 1540 | 46 | 191 |
| 6 | 899 | 50 | 121 | 4230 | 347 | 3960 | 1590 | 49 | 210 |
| 7 | 1140 | 67 | 206 | 3690 | 243 | 2420 | 1500 | 37 | 150 |
| 8 | 1310 | 98 | 347 | 3430 | 245 | 2270 | 1470 | 33 | 131 |
| 9 | 1420 | 112 | 429 | 3650 | 288 | 2840 | 1430 | 29 | 112 |
| 10 | 1690 | 202 | 922 | 3690 | 252 | 2510 | 1350 | 29 | 106 |
| 11 | 1710 | 214 | 988 | 3520 | 216 | 2050 | 1250 | 27 | 91 |
| 12 | 1530 | 113 | 467 | 3610 | 263 | 2560 | 1180 | 29 | 92 |
| 13 | 1410 | 83 | 316 | 3850 | 272 | 2830 | 1190 | 32 | 103 |
| 14 | 1390 | 64 | 240 | 3610 | 250 | 2440 | 1280 | 35 | 121 |
| 15 | 1490 | 78 | 314 | 2790 | 157 | 1180 | 1130 | 24 | 73 |
| 16 | 1580 | 55 | 235 | 2440 | 99 | 652 | 1020 | 24 | 66 |
| 17 | 1550 | 38 | 159 | 2230 | 79 | 476 | 959 | 21 | 54 |
| 18 | 1450 | 27 | 106 | 1960 | 77 | 407 | 931 | 21 | 53 |
| 19 | 1370 | 27 | 100 | 1820 | 65 | 319 | 938 | 20 | 51 |
| 20 | 1420 | 46 | 176 | 1680 | 56 | 254 | 945 | 20 | 51 |
| 21 | 1740 | 117 | 550 | 1540 | 49 | 204 | 896 | 17 | 41 |
| 22 | 2190 | 150 | 887 | 1450 | 48 | 188 | 910 | 19 | 47 |
| 23 | 2620 | 148 | 1050 | 1450 | 48 | 188 | 973 | 23 | 60 |
| 24 | 2990 | 277 | 2240 | 1610 | 77 | 335 | 910 | 16 | 39 |
| 25 | 3120 | 423 | 3560 | 1980 | 165 | 882 | 854 | 17 | 39 |
| 26 | 3220 | 419 | 3640 | 2220 | 188 | 1130 | 896 | 27 | 65 |
| 27 | 2930 | 160 | 1270 | 2870 | 288 | 2230 | 763 | 13 | 27 |
| 28 | 2650 | 118 | 844 | 2920 | 266 | 2100 | 721 | 15 | 29 |
| 29 | 2530 | 83 | 567 | 2430 | 135 | 886 | 889 | 30 | 72 |
| 30 | 2370 | 59 | 378 | 2270 | 108 | 662 | 854 | 26 | 60 |
| 31 | -- | -- | -- | 2290 | 90 | 556 | -- | -- | -- |
| TOTAL | 51419 | -- | 20507 | 85670 | -- | 58215 | 35729 | -- | 3344 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | SEDIMENT DISCHARGE (TONS/DAY) |
| 1 | 814 | 23 | 51 | 276 | 4 | 3.0 | 195 | 2 | 1.1 |
| 2 | 801 | 12 | 26 | 268 | 4 | 2.9 | 206 | 2 | 1.1 |
| 3 | 757 | 11 | 22 | 285 | 5 | 3.8 | 208 | 2 | 1.1 |
| 4 | 709 | 9 | 17 | 303 | 6 | 4.9 | 199 | 3 | 1.6 |
| 5 | 667 | 9 | 16 | 275 | 7 | 5.2 | 189 | 3 | 1.5 |
| 6 | 644 | 8 | 14 | 297 | 7 | 5.6 | 181 | 2 | .98 |
| 7 | 622 | 8 | 13 | 284 | 4 | 3.1 | 178 | 1 | .48 |
| 8 | 575 | 11 | 17 | 258 | 5 | 3.5 | 173 | 2 | .93 |
| 9 | 561 | 9 | 14 | 244 | 9 | 5.9 | 168 | 2 | .91 |
| 10 | 750 | 70 | 143 | 234 | 4 | 2.5 | 166 | 5 | 2.2 |
| 11 | 766 | 29 | 60 | 226 | 4 | 2.4 | 163 | 2 | .88 |
| 12 | 683 | 11 | 20 | 217 | 7 | 4.1 | 159 | 3 | 1.3 |
| 13 | 625 | 8 | 14 | 213 | 5 | 2.9 | 156 | 13 | 5.5 |
| 14 | 586 | 8 | 13 | 213 | 4 | 2.3 | 152 | 5 | 2.1 |
| 15 | 559 | 7 | 11 | 207 | 3 | 1.7 | 153 | 2 | .83 |
| 16 | 538 | 6 | 8.7 | 201 | 3 | 1.6 | 152 | 1 | .41 |
| 17 | 523 | 6 | 8.5 | 194 | 2 | 1.0 | 150 | 3 | 1.2 |
| 18 | 494 | 4 | 5.3 | 190 | 3 | 1.5 | 150 | 2 | .81 |
| 19 | 474 | 8 | 10 | 186 | 4 | 2.0 | 150 | 10 | 4.1 |
| 20 | 453 | 6 | 7.3 | 183 | 4 | 2.0 | 156 | 2 | .84 |
| 21 | 437 | 8 | 9.4 | 179 | 3 | 1.4 | 155 | 1 | .42 |
| 22 | 424 | 6 | 6.9 | 178 | 4 | 1.9 | 150 | 2 | .81 |
| 23 | 401 | 5 | 5.4 | 189 | 3 | 1.5 | 149 | 6 | 2.4 |
| 24 | 379 | 5 | 5.1 | 187 | 3 | 1.5 | 148 | 2 | .80 |
| 25 | 358 | 5 | 4.8 | 179 | 3 | 1.4 | 147 | 1 | .40 |
| 26 | 342 | 5 | 4.6 | 175 | 2 | .95 | 151 | 1 | .41 |
| 27 | 327 | 5 | 4.4 | 170 | 10 | 4.6 | 152 | 1 | .41 |
| 28 | 316 | 21 | 18 | 166 | 4 | 1.8 | 154 | 1 | .42 |
| 29 | 309 | 4 | 3.3 | 164 | 4 | 1.8 | 155 | 1 | .42 |
| 30 | 298 | 6 | 4.8 | 171 | 6 | 2.8 | 154 | 1 | .42 |
| 31 | 286 | 3 | 2.3 | 194 | 4 | 2.1 | -- | -- | -- |
| TOTAL | 16478 | -- | 559.8 | 6706 | -- | 83.65 | 4919 | -- | 36.78 |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 267142
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 106249.96

12303000 KOOTENAI RIVER AT LIBBY, MONT.

LOCATION.--Lat 48°23'52", long 115°32'48", in NW¼NE¼ sec.3, T.30 N., R.31 W., Lincoln County, at bridge on State Highway 37 at Libby, 1,800 ft upstream from gaging station, 0.5 mile downstream from Libby Creek,, and at mile 204.6.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 13... | 1200 | 4960 | -- | -- | 35 | 3.6 | .7 | 183 | .25 | 2450 | 150 | 5 |
| NOV. | | | | | | | | | | | | |
| 16... | 1500 | 3610 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 09... | 1145 | 4300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 20... | 1330 | 4500 | 45 | -- | -- | 4.2 | .9 | 180 | .24 | 2190 | 160 | -- |
| FEB. | | | | | | | | | | | | |
| 16... | 1315 | 6370 | -- | -- | -- | 2.8 | 1.0 | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 16... | 1300 | 3500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 13... | 1200 | 7700 | 37 | -- | 31 | 2.4 | .9 | 156 | .21 | 3240 | 140 | 3 |
| MAY | | | | | | | | | | | | |
| 18... | 1145 | 36300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 08... | 1200 | 62500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 28... | 1100 | 20800 | 29 | .3 | -- | -- | .2 | -- | -- | -- | 100 | 1 |
| AUG. | | | | | | | | | | | | |
| 16... | 1030 | 11700 | -- | -- | -- | -- | .3 | -- | -- | -- | -- | 3 |
| SEP. | | | | | | | | | | | | |
| 15... | 0930 | 7120 | -- | -- | -- | -- | .5 | -- | -- | -- | -- | 1 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN. | | | | | | | | | | | | |
| 20... | 1330 | 4500 | -- | -- | -- | -- | 70 | -- | 12 | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 13... | 1200 | 7700 | -- | -- | -- | -- | -- | -- | 11 | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 28... | 1100 | 20800 | 0 | 0 | 0 | 1 | 20 | 0 | 7.4 | .0 | 0 | 20 |
| AUG. | | | | | | | | | | | | |
| 16... | 1030 | 11700 | -- | -- | -- | -- | 20 | -- | -- | .8 | -- | 10 |
| SEP. | | | | | | | | | | | | |
| 15... | 0930 | 7120 | -- | -- | -- | -- | 20 | -- | -- | .9 | -- | 10 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL CHRO-MIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JULY | | | | | | | | | | |
| 28... | 1100 | 20800 | 0 | <1 | 0 | <10 | 140 | 5 | .0 | 30 |

12303000 KOOTENAI RIVER AT LIBBY, MONT.--Continued

DRAINAGE AREA.--10,240 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 13... | 2 | .1 | .010 | -- | .00 | .20 | .14 | .42 | .13 | 58 | 1.1 |
| NOV. | | | | | | | | | | | |
| 16... | -- | .3 | .010 | -- | .09 | .13 | .24 | .74 | .28 | 5.0 | 1.1 |
| DEC. | | | | | | | | | | | |
| 09... | -- | .2 | .010 | -- | .13 | .56 | .21 | .63 | .31 | 36 | .8 |
| JAN. | | | | | | | | | | | |
| 20... | 5 | -- | .030 | .00 | -- | .00 | .21 | .62 | -- | 4.0 | 1.4 |
| FEB. | | | | | | | | | | | |
| 16... | -- | -- | .000 | .30 | .02 | .06 | .13 | .38 | .16 | 2.0 | 4.8 |
| MAR. | | | | | | | | | | | |
| 16... | -- | -- | .000 | .00 | .31 | .02 | .20 | .60 | .35 | 7.0 | .7 |
| APR. | | | | | | | | | | | |
| 13... | 5 | .1 | .000 | .10 | .05 | .08 | .050 | .15 | .10 | 7.0 | 1.9 |
| MAY | | | | | | | | | | | |
| 18... | -- | .1 | .000 | .10 | .07 | .18 | .060 | .21 | .20 | 5.0 | .7 |
| JUNE | | | | | | | | | | | |
| 08... | -- | .1 | .010 | .09 | .09 | .18 | .050 | .18 | .32 | .0 | .5 |
| JULY | | | | | | | | | | | |
| 28... | 7 | .00 | .000 | .02 | .10 | -- | .030 | .03 | .050 | 6.0 | 1.1 |
| AUG. | | | | | | | | | | | |
| 16... | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | .7 |
| SEP. | | | | | | | | | | | |
| 15... | 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.7 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 13... | 1200 | 7.5 | 5.5 | 300 | 11.3 | 7.7 | 116 | 12 | 4 |
| NOV. | | | | | | | | | |
| 16... | 1500 | 3.5 | 4.5 | 340 | 12.5 | 7.9 | 122 | 12 | 1 |
| DEC. | | | | | | | | | |
| 09... | 1145 | .0 | -2.0 | 170 | 13.3 | 7.3 | 122 | 38 | 1 |
| JAN. | | | | | | | | | |
| 20... | 1330 | .0 | 4.0 | 320 | 11.7 | 6.8 | 120 | 120 | 86 |
| FEB. | | | | | | | | | |
| 16... | 1315 | 2.5 | -- | 275 | 12.5 | 7.5 | 98 | 120 | 20 |
| MAR. | | | | | | | | | |
| 16... | 1300 | 4.0 | 3.0 | 340 | 12.9 | 8.4 | 120 | 1 | 0 |
| APR. | | | | | | | | | |
| 13... | 1200 | 6.0 | 7.0 | 290 | 11.6 | 8.1 | 100 | 22 | 4 |
| MAY | | | | | | | | | |
| 18... | 1145 | 7.5 | 10.0 | 215 | 12.6 | 8.1 | 88 | 48 | 80 |
| JUNE | | | | | | | | | |
| 08... | 1200 | 9.0 | 20.5 | 195 | 12.0 | 7.8 | 93 | 320 | 120 |
| JULY | | | | | | | | | |
| 28... | 1100 | 17.0 | 24.0 | 225 | 9.8 | 8.0 | 84 | 28 | 4 |
| AUG. | | | | | | | | | |
| 16... | 1030 | 17.0 | 21.0 | 255 | 10.0 | 8.2 | 97 | 25 | 0 |
| SEP. | | | | | | | | | |
| 15... | 0930 | 11.5 | 2.0 | 300 | 11.2 | 8.3 | 117 | 68 | 6 |

## 12304500 YAAK RIVER NEAR TROY, MONT.

LOCATION.--Lat 48°33'43", long 115°58'09", in NE¼SE¼SE¼ sec.5, T.32 N., R.34 W., Lincoln County, Kootenai National Forest, temperature recorder at gaging station on right bank 500 ft upstream from bridge on U.S. Highway 2, 0.2 mile upstream from mouth, and 7.7 miles northwest of Troy.

DRAINAGE AREA.--766 sq mi.

PERIOD OF RECORD.--Water temperatures: May 1963 to September 1971 (seasonal records only).

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 13.5 | 9.5 | 4.5 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 13.5 | 9.5 | 4.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | 13.5 | 9.5 | 3.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 13.5 | 9.5 | 3.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 13.5 | 10.0 | 4.5 | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 11.0 | 7.0 | 5.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 8.5 | 6.0 | 5.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 8.0 | 6.0 | 5.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 10.0 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 9.5 | 8.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 10.0 | 7.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 2.0 |
| 13 | 10.0 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.0 |
| 14 | 8.5 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.5 |
| 15 | 8.0 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 3.0 |
| 16 | 7.0 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.5 |
| 17 | 8.0 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | 1.0 |
| 18 | 6.5 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 0.5 |
| 19 | 8.5 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 1.5 |
| 20 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 1.5 |
| 21 | 8.5 | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.5 |
| 22 | 8.5 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 3.5 | 1.0 |
| 23 | 8.0 | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 1.0 |
| 24 | 8.0 | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 3.5 |
| 25 | 7.0 | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 3.0 |
| 26 | 5.0 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 2.0 |
| 27 | 4.5 | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | 4.5 | 2.0 |
| 28 | 4.5 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | 3.5 |
| 29 | 4.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | 5.5 | 4.0 |
| 30 | 4.5 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | 6.5 | 4.5 |
| 31 | 4.0 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | 6.5 | 3.5 |
| MONTH | 13.5 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## PEND OREILLE RIVER BASIN

## 12323800 CLARK FORK NEAR GALEN, MONT.

LOCATION.--Lat 46°12'30", long 112°46'00", in NE¼NE¼NE¼ sec.7, T.5 N., R.9 W., Deer Lodge County, on upstream side of county bridge, 1.6 miles downstream from Warm Springs Creek, 1.9 miles southeast of Galen, and at mile 481.9.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) | COLOR (PLAT-INUM-COBALT UNITS) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| JULY 25... | 1100 | 29 | 220 | 5.6 | 1.7 | 670 | 2 | 10 | .2 |
| AUG. 18... | 1300 | 80 | -- | -- | 3.8 | -- | 1 | 5 | -- |
| SEP. 15... | 1115 | 45 | -- | -- | 2.7 | -- | 2 | 10 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JULY 25... | 1100 | 29 | 0 | 2 | 0 | 30 | 20 | 0 | 29 | .0 | 0 | 180 |
| AUG. 18... | 1300 | 80 | -- | -- | -- | -- | 20 | -- | -- | .2 | -- | 240 |
| SEP. 15... | 1115 | 45 | -- | -- | -- | -- | 20 | -- | -- | .2 | -- | 530 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL CHRO-MIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JULY 25... | 1100 | 29 | 10 | 1 | 0 | <10 | 10 | 1 | .0 | 260 |

12304500 YAAK RIVER NEAR TROY, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 25.0°C Aug. 8.

Period of record:
Water temperatures: Maximum, 25.0°C Aug. 8, 1971.

REMARKS.--Recorder removed Nov. 9 to Mar. 11, inoperative May 29 to June 15. Records furnished by Corps of Engineers, U.S. Army.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.5 | 2.0 | 8.5 | 4.5 | --- | --- | 15.0 | 11.0 | 23.5 | 20.0 | 16.5 | 14.0 |
| 2 | 6.5 | 4.0 | 8.5 | 5.0 | --- | --- | 15.0 | 11.0 | 24.0 | 20.5 | 15.0 | 13.5 |
| 3 | 7.0 | 3.5 | 8.5 | 4.5 | --- | --- | 15.0 | 11.0 | 24.0 | 21.0 | 15.0 | 13.5 |
| 4 | 7.0 | 3.5 | 8.0 | 4.5 | --- | --- | 15.0 | 11.0 | 24.0 | 19.5 | 18.0 | 14.0 |
| 5 | 8.0 | 3.5 | 6.5 | 5.0 | --- | --- | 15.0 | 11.0 | 24.0 | 20.0 | 18.5 | 14.0 |
| 6 | 8.5 | 4.0 | 6.5 | 5.0 | --- | --- | 13.0 | 10.5 | 23.0 | 20.0 | 16.0 | 13.5 |
| 7 | 8.0 | 4.5 | 8.0 | 5.0 | --- | --- | 14.5 | 9.0 | 24.5 | 19.0 | 16.5 | 12.0 |
| 8 | 6.5 | 3.5 | 8.5 | 5.5 | --- | --- | 14.5 | 11.0 | 25.0 | 20.0 | 16.5 | 13.0 |
| 9 | 6.5 | 4.0 | 8.5 | 5.5 | --- | --- | 15.0 | 12.0 | 24.5 | 20.0 | 16.5 | 13.0 |
| 10 | 5.0 | 3.5 | 8.5 | 5.5 | --- | --- | 15.0 | 13.0 | 24.5 | 19.5 | 18.0 | 13.0 |
| 11 | 4.5 | 3.0 | 9.0 | 6.0 | --- | --- | 14.0 | 11.5 | 24.5 | 19.5 | 16.5 | 14.0 |
| 12 | 6.0 | 3.5 | 9.0 | 6.0 | --- | --- | 15.5 | 11.5 | 24.0 | 19.5 | 15.5 | 13.0 |
| 13 | 7.0 | 3.5 | 8.0 | 6.0 | --- | --- | 16.5 | 12.0 | 23.5 | 18.5 | 15.5 | 12.0 |
| 14 | 6.5 | 4.0 | 8.0 | 6.0 | --- | --- | 18.0 | 13.0 | 23.0 | 18.5 | 14.5 | 10.5 |
| 15 | 6.5 | 5.0 | 7.0 | 5.5 | --- | --- | 18.5 | 14.0 | 21.5 | 16.5 | 14.0 | 9.5 |
| 16 | 6.0 | 4.5 | 7.0 | 5.5 | 11.5 | 8.5 | 19.5 | 14.5 | 21.0 | 16.5 | 13.0 | 10.5 |
| 17 | 6.0 | 4.0 | 8.5 | 6.0 | 11.5 | 9.0 | 20.0 | 15.0 | 21.0 | 16.0 | 13.5 | 9.0 |
| 18 | 7.0 | 4.0 | 9.0 | 6.0 | 11.5 | 9.5 | 20.5 | 15.5 | 21.0 | 16.0 | 13.0 | 8.5 |
| 19 | 8.5 | 4.0 | 9.0 | 6.0 | 11.5 | 9.5 | 21.0 | 16.5 | 22.0 | 16.0 | 12.0 | 9.0 |
| 20 | 7.0 | 4.5 | 8.0 | 5.5 | 11.5 | 9.5 | 21.0 | 17.0 | 21.5 | 16.5 | 12.0 | 9.5 |
| 21 | 7.0 | 5.0 | 8.5 | 5.5 | 14.0 | 10.0 | 22.0 | 18.5 | 21.0 | 16.0 | 12.0 | 9.0 |
| 22 | 6.5 | 4.5 | 10.0 | 5.5 | 14.5 | 11.0 | 23.0 | 19.0 | 19.5 | 15.5 | 13.0 | 9.0 |
| 23 | 6.0 | 4.0 | 10.0 | 6.5 | 14.5 | 12.0 | 22.0 | 18.5 | 18.5 | 14.5 | 14.0 | 9.0 |
| 24 | 6.0 | 3.5 | 10.0 | 6.5 | 14.0 | 11.0 | 22.0 | 18.0 | 19.5 | 14.5 | 13.5 | 10.0 |
| 25 | 6.5 | 4.0 | 10.0 | 6.5 | 14.0 | 11.0 | 22.0 | 18.5 | 21.0 | 15.5 | 13.0 | 10.5 |
| 26 | 6.5 | 4.0 | 10.5 | 6.0 | 13.5 | 10.0 | 21.5 | 18.0 | 21.0 | 15.5 | 11.5 | 9.5 |
| 27 | 6.5 | 4.5 | 10.5 | 7.0 | 13.5 | 10.5 | 22.0 | 18.5 | 21.5 | 16.0 | 11.0 | 10.0 |
| 28 | 6.0 | 4.5 | 10.0 | 7.0 | 13.0 | 10.0 | 22.0 | 19.0 | 20.5 | 17.0 | 11.0 | 9.5 |
| 29 | 6.5 | 4.5 | --- | --- | 12.0 | 9.5 | 21.0 | 17.0 | 21.5 | 16.0 | 11.0 | 8.5 |
| 30 | 8.0 | 4.5 | --- | --- | 14.5 | 9.5 | 21.5 | 18.0 | 20.0 | 18.0 | 10.0 | 8.0 |
| 31 | --- | --- | --- | --- | --- | --- | 23.0 | 19.5 | 19.5 | 15.5 | --- | --- |
| MONTH | 8.5 | 2.0 | 10.5 | 4.5 | --- | --- | 23.0 | 9.0 | 25.0 | 14.5 | 18.5 | 8.0 |
| YEAR | 25.0 | 0.5 | | | | | | | | | | |

PEND OREILLE RIVER BASIN

12323800 CLARK FORK NEAR GALEN, MONT.--Continued

DRAINAGE AREA.--793 sq mi.

PERIOD OF RECORD.--Chemical analyses: July to September 1971.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| JULY 25... | .000 | .20 | .61 | .040 | .03 | .050 | 8.0 | 1.2 |
| AUG. 18... | -- | -- | -- | -- | -- | -- | -- | 5.6 |
| SEP. 15... | -- | -- | -- | -- | -- | -- | -- | 2.2 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| JULY 25... | 1100 | 16.0 | 20.0 | 1260 | 8.6 | 7.9 | 108 | 160 | 20 |
| AUG. 18... | 1300 | 18.5 | 23.0 | 1800 | 8.2 | 7.6 | 38 | 2100 | 20 |
| SEP. 15... | 1115 | 10.0 | 13.0 | 1700 | 11.0 | 7.5 | 69 | 2800 | 6 |

12324200 CLARK FORK AT DEER LODGE, MONT.

LOCATION.--Lat 46°23'52", long 112°44'31", in SW¼SW¼ sec.33, T.8 N., R.9 W., Powell County, at county bridge on Milwaukee Avenue at Deer Lodge and at mile 461.2.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 0900 | 229 | -- | 6.4 | 560 | 8.6 | 1.9 | 1030 | 1.40 | 637 | 690 | 5 |
| NOV. | | | | | | | | | | | | |
| 05... | 0735 | 290 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 02... | 1630 | 340 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 06... | 1530 | 253 | 270 | 6.0 | 680 | 2.7 | 1.4 | 1140 | 1.55 | 779 | 790 | 2 |
| FEB. | | | | | | | | | | | | |
| 03... | 1410 | 410 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 05... | 0900 | 305 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 08... | 1630 | 325 | 260 | 5.2 | 660 | 5.6 | 1.9 | 1040 | 1.41 | 913 | 730 | 6 |
| MAY | | | | | | | | | | | | |
| 06... | 0710 | 575 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 04... | 1300 | 582 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 0900 | 229 | 200 | 0 | 0 | 0 | 30 | 1 | 0 | 0 | 40 | 0 |
| NOV. | | | | | | | | | | | | |
| 05... | 0735 | 290 | -- | -- | -- | -- | 20 | -- | -- | -- | 0 | 0 |
| DEC. | | | | | | | | | | | | |
| 02... | 1630 | 340 | -- | -- | -- | -- | 30 | -- | -- | -- | 0 | 60 |
| JAN. | | | | | | | | | | | | |
| 06... | 1530 | 253 | -- | 0 | 0 | 0 | 0 | 17 | 0 | 7 | 7 | 100 |
| FEB. | | | | | | | | | | | | |
| 03... | 1410 | 410 | -- | -- | -- | -- | 10 | -- | -- | -- | 14 | 120 |
| MAR. | | | | | | | | | | | | |
| 05... | 0900 | 305 | -- | -- | -- | -- | 10 | -- | -- | -- | 25 | 120 |
| APR. | | | | | | | | | | | | |
| 08... | 1630 | 325 | 200 | 0 | 100 | 0 | 30 | 2 | 0 | 0 | 15 | 20 |
| MAY | | | | | | | | | | | | |
| 06... | 0710 | 575 | -- | -- | -- | -- | 10 | -- | -- | -- | 9 | 30 |
| JUNE | | | | | | | | | | | | |
| 04... | 1300 | 582 | -- | -- | -- | -- | 20 | -- | -- | -- | 16 | 20 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 0900 | 229 | 20 | 200 | 7 | 360 | -- | 580 | 180 |
| DEC. | | | | | | | | | |
| 02... | 1630 | 340 | 60 | 400 | 50 | 600 | <.1 | 450 | 220 |
| JAN. | | | | | | | | | |
| 06... | 1530 | 253 | -- | -- | -- | -- | .1 | -- | -- |
| FEB. | | | | | | | | | |
| 03... | 1410 | 410 | 210 | 120 | 10 | 1000 | -- | 330 | 350 |
| MAR. | | | | | | | | | |
| 05... | 0900 | 305 | -- | -- | -- | -- | .2 | -- | -- |
| APR. | | | | | | | | | |
| 08... | 1630 | 325 | 70 | 580 | 9 | 530 | .1 | 490 | 200 |
| MAY | | | | | | | | | |
| 06... | 0710 | 575 | -- | -- | -- | -- | .3 | -- | -- |
| JUNE | | | | | | | | | |
| 04... | 1300 | 582 | 110 | 1500 | 19 | 370 | -- | 300 | 210 |

12324200 CLARK FORK AT DEER LODGE, MONT.--Continued

DRAINAGE AREA.--1,005 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 08... | 3 | .5 | .020 | -- | .05 | .30 | .070 | .22 | .10 | 9.0 | -- |
| NOV. | | | | | | | | | | | |
| 05... | -- | .6 | -- | -- | .10 | -- | .030 | .08 | .050 | 28 | .8 |
| DEC. | | | | | | | | | | | |
| 02... | -- | .7 | -- | -- | .06 | -- | .050 | .01 | .12 | 5.0 | 1.7 |
| JAN. | | | | | | | | | | | |
| 06... | 3 | -- | .060 | .20 | .12 | -- | -- | .06 | -- | 3.0 | 2.3 |
| FEB. | | | | | | | | | | | |
| 03... | -- | -- | -- | .50 | .37 | -- | -- | .07 | .13 | 130 | 4.3 |
| MAR. | | | | | | | | | | | |
| 05... | -- | -- | -- | .20 | .58 | -- | -- | .10 | .070 | 11 | 1.4 |
| APR. | | | | | | | | | | | |
| 08... | 5 | .4 | .040 | .40 | .06 | .20 | .020 | .15 | .090 | 2.0 | 1.6 |
| MAY | | | | | | | | | | | |
| 06... | -- | -- | -- | .40 | .21 | -- | -- | .15 | .18 | 7.0 | 2.0 |
| JUNE | | | | | | | | | | | |
| 04... | -- | -- | -- | .26 | .14 | -- | -- | .12 | .10 | 5.0 | 1.9 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 08... | 0 | -- | 380 | .0 | 2 | 2 | 0 | 0 | 660 | .3 | 190 |
| NOV. | | | | | | | | | | | |
| 05... | 0 | -- | 830 | .8 | -- | -- | -- | -- | 560 | -- | 160 |
| DEC. | | | | | | | | | | | |
| 02... | 0 | -- | 950 | .4 | -- | -- | -- | -- | 700 | -- | 150 |
| JAN. | | | | | | | | | | | |
| 06... | 0 | 26 | 4 | -- | 2 | 2 | 2 | 0 | 530 | 2.0 | 520 |
| FEB. | | | | | | | | | | | |
| 03... | 6 | -- | 1400 | .4 | -- | -- | -- | -- | 420 | -- | 130 |
| MAR. | | | | | | | | | | | |
| 05... | 0 | -- | 110 | .2 | -- | -- | -- | -- | 710 | -- | 140 |
| APR. | | | | | | | | | | | |
| 08... | 5 | 19 | 480 | .1 | 0 | 1 | 0 | 1 | 580 | .0 | 110 |
| MAY | | | | | | | | | | | |
| 06... | 0 | -- | 150 | .1 | -- | -- | -- | -- | 530 | -- | 10 |
| JUNE | | | | | | | | | | | |
| 04... | 2 | -- | 170 | .3 | -- | -- | -- | -- | 550 | -- | 40 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 0900 | 4.5 | .0 | 1190 | 10.9 | 7.9 | 126 | 18000 | 11000 |
| NOV. | | | | | | | | | |
| 05... | 0735 | 3.0 | 2.0 | 1100 | 10.5 | 7.7 | 121 | 0 | 8 |
| DEC. | | | | | | | | | |
| 02... | 1630 | 1.0 | 6.5 | 1250 | 11.6 | 8.0 | 120 | -- | 10 |
| 04... | 1620 | -- | -- | -- | -- | -- | -- | 13 | -- |
| JAN. | | | | | | | | | |
| 06... | 1530 | .0 | -7.5 | 1380 | 11.6 | 7.4 | 130 | 68 | 22 |
| FEB. | | | | | | | | | |
| 03... | 1410 | 1.5 | -5.0 | 960 | 11.0 | 7.5 | 92 | 110 | 0 |
| MAR. | | | | | | | | | |
| 05... | 0900 | .0 | -7.0 | 1310 | 11.6 | 7.9 | 105 | 47 | 13 |
| APR. | | | | | | | | | |
| 08... | 1630 | 8.5 | 13.0 | 1250 | 11.6 | 8.1 | 106 | 5500 | 120 |
| MAY | | | | | | | | | |
| 06... | 0710 | 10.5 | 8.5 | 845 | 9.8 | 7.7 | 77 | 4300 | 100 |
| JUNE | | | | | | | | | |
| 04... | 1300 | 12.5 | 15.0 | 810 | 9.8 | 7.8 | 75 | 5700 | 2800 |

## 12324600 CLARK FORK AT GARRISON, MONT.

LOCATION.--Lat 46°31'11", long 112°48'27", near center of east line of sec.23, T.9 N., R.10 W., Powell County, at county bridge at Garrison, 1 mile downstream from Little Blackfoot River and at mile 444.5.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 1145 | 318 | -- | 5.5 | 360 | 8.0 | 1.0 | 729 | .99 | 626 | 540 | 5 |
| NOV. | | | | | | | | | | | | |
| 05... | 1000 | 379 | -- | 5.3 | -- | -- | 1.2 | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 03... | 0800 | 383 | -- | 5.3 | -- | -- | 1.5 | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 06... | 1030 | 370 | 250 | -- | 620 | 4.1 | 1.3 | 1090 | 1.48 | 1090 | 720 | 1 |
| FEB. | | | | | | | | | | | | |
| 03... | 1115 | 640 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 05... | 1200 | 430 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 09... | 1000 | 480 | 180 | -- | 390 | -- | -- | -- | -- | -- | 510 | -- |
| MAY | | | | | | | | | | | | |
| 06... | 0915 | 1130 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 02... | 1230 | 1460 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 08... | 1145 | 318 | 100 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 22 | 0 |
| NOV. | | | | | | | | | | | | |
| 05... | 1000 | 379 | 100 | 0 | 0 | 0 | 20 | 4 | 0 | 0 | 27 | 0 |
| DEC. | | | | | | | | | | | | |
| 03... | 0800 | 383 | 200 | 10 | 0 | 0 | 20 | 2 | 0 | 0 | 16 | 90 |
| JAN. | | | | | | | | | | | | |
| 06... | 1030 | 370 | -- | -- | -- | -- | 40 | -- | -- | -- | 0 | 140 |
| FEB. | | | | | | | | | | | | |
| 03... | 1115 | 640 | -- | -- | -- | -- | 10 | -- | -- | -- | 14 | 140 |
| MAR. | | | | | | | | | | | | |
| 05... | 1200 | 430 | -- | -- | -- | -- | 10 | -- | -- | -- | 64 | 560 |
| APR. | | | | | | | | | | | | |
| 09... | 1000 | 480 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | | | | | | | | | | | | |
| 06... | 0915 | 1130 | -- | -- | -- | -- | 0 | -- | -- | -- | 6 | 40 |
| JUNE | | | | | | | | | | | | |
| 02... | 1230 | 1460 | -- | -- | -- | -- | 30 | -- | -- | -- | 21 | 70 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1145 | 318 | 20 | 170 | 3 | 270 | -- | 510 | 150 |
| NOV. | | | | | | | | | |
| 05... | 1000 | 379 | -- | -- | -- | -- | .2 | -- | -- |
| DEC. | | | | | | | | | |
| 03... | 0800 | 383 | 20 | 140 | <1 | 320 | <.1 | 410 | 130 |
| FEB. | | | | | | | | | |
| 03... | 1115 | 640 | 130 | 90 | 10 | 690 | <.1 | 250 | 250 |
| MAR. | | | | | | | | | |
| 05... | 1200 | 430 | -- | -- | -- | -- | .2 | -- | -- |
| APR. | | | | | | | | | |
| 09... | 1000 | 480 | 40 | 420 | 7 | 300 | -- | 360 | 100 |
| MAY | | | | | | | | | |
| 06... | 0915 | 1130 | -- | -- | -- | -- | .1 | -- | -- |
| JUNE | | | | | | | | | |
| 02... | 1230 | 1460 | 90 | 1300 | 14 | 300 | .2 | 240 | 150 |

12324600 CLARK FORK AT GARRISON, MONT.--Continued

DRAINAGE AREA.--1,550 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 08... | 2 | .4 | .010 | -- | .03 | .21 | .080 | .15 | .080 | 17 | -- |
| NOV. | | | | | | | | | | | |
| 05... | -- | .6 | -- | -- | .09 | -- | .050 | .12 | .060 | 12 | .8 |
| DEC. | | | | | | | | | | | |
| 03... | -- | .7 | -- | -- | .18 | -- | .040 | .01 | .070 | 5.0 | 2.7 |
| JAN. | | | | | | | | | | | |
| 06... | 2 | -- | .050 | .10 | .20 | .03 | -- | .00 | -- | .0 | 2.7 |
| FEB. | | | | | | | | | | | |
| 03... | -- | -- | -- | .20 | .32 | -- | -- | .10 | .16 | 11 | 4.2 |
| MAR. | | | | | | | | | | | |
| 05... | -- | -- | -- | .10 | .43 | -- | -- | .10 | .070 | 3.0 | 1.1 |
| APR. | | | | | | | | | | | |
| 09... | -- | .3 | -- | -- | -- | -- | -- | .09 | -- | 3.0 | 1.9 |
| MAY | | | | | | | | | | | |
| 06... | -- | -- | -- | .30 | .00 | -- | -- | .12 | .12 | 5.0 | 2.0 |
| JUNE | | | | | | | | | | | |
| 02... | -- | -- | -- | .14 | .11 | -- | -- | .15 | .10 | 4.0 | 1.2 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 08... | 0 | -- | 210 | .0 | 3 | 1 | 0 | 1 | 540 | .6 | 90 |
| NOV. | | | | | | | | | | | |
| 05... | 0 | -- | 680 | .0 | 4 | 1 | 0 | 0 | 640 | .2 | 180 |
| DEC. | | | | | | | | | | | |
| 03... | 0 | -- | 480 | .4 | 6 | 0 | 12 | 1 | 620 | .7 | 140 |
| JAN. | | | | | | | | | | | |
| 06... | -- | 24 | 0 | -- | -- | -- | -- | -- | 530 | -- | 380 |
| FEB. | | | | | | | | | | | |
| 03... | 0 | -- | 880 | .4 | -- | -- | -- | -- | 420 | -- | 130 |
| MAR. | | | | | | | | | | | |
| 05... | 8 | -- | 190 | .2 | -- | -- | -- | -- | 600 | -- | 140 |
| APR. | | | | | | | | | | | |
| 09... | -- | 15 | -- | -- | -- | -- | -- | -- | 410 | -- | 90 |
| MAY | | | | | | | | | | | |
| 06... | 0 | -- | 100 | .1 | -- | -- | -- | -- | 250 | -- | 20 |
| JUNE | | | | | | | | | | | |
| 02... | 2 | -- | 80 | .1 | -- | -- | -- | -- | 530 | -- | 70 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 08... | 1145 | 4.5 | 9.5 | 900 | 11.9 | 8.2 | 106 | 980 | 230 |
| NOV. | | | | | | | | | |
| 05... | 1000 | 3.0 | 4.5 | 1030 | 11.8 | 7.9 | 131 | 750 | 58 |
| DEC. | | | | | | | | | |
| 03... | 0800 | .0 | -8.5 | 1210 | 11.6 | 8.0 | 129 | -- | 52 |
| 04... | 1600 | -- | -- | -- | -- | -- | -- | 130 | -- |
| JAN. | | | | | | | | | |
| 06... | 1030 | .0 | -12.5 | 1250 | 12.0 | 7.8 | 148 | 400 | 120 |
| FEB. | | | | | | | | | |
| 03... | 1115 | .5 | -4.0 | 700 | 11.4 | 7.6 | 97 | 1100 | 74 |
| MAR. | | | | | | | | | |
| 05... | 1200 | .0 | -2.0 | 1130 | 12.5 | 8.2 | 114 | 93 | 0 |
| APR. | | | | | | | | | |
| 09... | 1000 | 5.0 | 10.5 | 910 | 11.8 | 8.1 | 106 | 6000 | 170 |
| MAY | | | | | | | | | |
| 06... | 0915 | 9.0 | 10.5 | 660 | 10.3 | 7.8 | 77 | 5100 | 440 |
| JUNE | | | | | | | | | |
| 02... | 1230 | 10.0 | 15.0 | 600 | 10.2 | 7.6 | 81 | -- | -- |
| 04... | 1630 | 10.5 | -- | -- | -- | -- | -- | 1700 | 60 |

## 12331600 CLARK FORK AT DRUMMOND, MONT.

LOCATION.--Lat 46°39'45", long 113°08'57", in SE¼NW¼SE¼ sec.31, T.11 N., R.12 W., Granite County, at bridge on U.S. Highway 10A, 0.4 mile southwest of Drummond, 0.9 mile downstream from Flint Creek and at mile 417.0.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) | COLOR (PLAT-INUM-COBALT UNITS) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| JULY | | | | | | | | | |
| 24... | 1120 | 246 | 130 | 4.6 | 1.0 | 400 | 1 | 9 | .1 |
| AUG. | | | | | | | | | |
| 17... | 1145 | 223 | -- | -- | .9 | -- | 3 | 7 | -- |
| SEP. | | | | | | | | | |
| 15... | 1545 | 384 | -- | -- | .6 | -- | 6 | 10 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JULY | | | | | | | | | | | | |
| 24... | 1120 | 246 | 0 | 0 | 0 | 20 | 10 | 0 | 19 | .0 | 4 | 30 |
| AUG. | | | | | | | | | | | | |
| 17... | 1145 | 223 | -- | -- | -- | -- | 20 | -- | -- | .1 | -- | 0 |
| SEP. | | | | | | | | | | | | |
| 15... | 1545 | 384 | -- | -- | -- | -- | 10 | -- | -- | .2 | -- | 20 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL CHRO-MIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JULY | | | | | | | | | | |
| 24... | 1120 | 246 | 10 | <1 | 0 | 20 | 10 | 5 | .0 | 30 |

12331600 CLARK FORK AT DRUMMOND, MONT.--Continued

DRAINAGE AREA.--2,378 sq mi.

PERIOD OF RECORD.--Chemical analyses: July to September 1971.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| JULY 24... | .000 | .07 | .10 | .080 | .18 | .090 | 9.0 | .9 |
| AUG. 17... | -- | -- | -- | -- | -- | -- | -- | 1.5 |
| SEP. 15... | -- | -- | -- | -- | -- | -- | -- | 1.8 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| JULY 24... | 1120 | 18.0 | 25.0 | 800 | 8.8 | 8.2 | 177 | 58 | 25 |
| AUG. 17... | 1145 | 16.0 | 24.5 | 750 | 10.0 | 8.2 | 189 | 280 | 62 |
| SEP. 15... | 1545 | 12.0 | 17.0 | 650 | 10.8 | 8.2 | 190 | 100 | 40 |

## 12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.

LOCATION.--Lat 46°59'21", long 112°30'40", in SE¼SE¼SW¼ sec.5, T.14 N., R.7 W., Lewis and Clark County, at gaging station at bridge 0.4 mile upstream from mouth of Hogum Creek, 3.0 miles downstream from Alice Creek, and 8.2 miles northeast of Lincoln.

DRAINAGE AREA.--96.9 sq mi.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 02... | 0900 | 20 | 6.5 | 14 | -- | 34 | 12 | 2.7 | 1.1 | 151 | 0 | 11 |
| 15... | 1230 | 21 | -- | -- | 0 | -- | 12 | -- | -- | -- | -- | -- |
| 23... | 0800 | 20 | 6.0 | 13 | -- | 30 | 11 | 2.5 | 1.0 | 134 | 0 | 11 |
| NOV. | | | | | | | | | | | | |
| 18... | 1100 | 17 | 2.0 | -- | 70 | -- | -- | -- | -- | -- | -- | -- |
| 19... | 1300 | 17 | 2.0 | 14 | -- | 23 | 7.1 | 1.5 | .6 | 101 | 0 | 7.6 |
| 30... | 0900 | 18 | 2.0 | 13 | -- | 27 | 11 | 2.4 | 1.4 | 134 | 0 | 13 |
| DEC. | | | | | | | | | | | | |
| 01... | 1520 | 18 | 1.5 | 12 | -- | 27 | 12 | 2.1 | 1.3 | 134 | 0 | 13 |
| 24... | 1730 | 14 | .0 | 12 | -- | 25 | 12 | 1.9 | 1.2 | 129 | 0 | 12 |
| JAN. | | | | | | | | | | | | |
| 04... | 1730 | 15 | .0 | 14 | 50 | 31 | 12 | 2.4 | 1.3 | 147 | 0 | 9.5 |
| 21... | 1500 | 19 | .0 | 21 | 110 | -- | 11 | -- | -- | -- | -- | -- |
| 27... | 1730 | 12 | .0 | 12 | 40 | 27 | 11 | 2.1 | 1.1 | 128 | 0 | 4.2 |
| FEB. | | | | | | | | | | | | |
| 09... | 1530 | 23 | .0 | 13 | 10 | 25 | 11 | 2.4 | 1.4 | 126 | 4 | 16 |
| 26... | 1730 | 18 | .0 | 12 | 20 | 25 | 11 | 2.4 | 1.2 | 126 | 4 | 13 |
| MAR. | | | | | | | | | | | | |
| 06... | 1230 | 23 | .0 | 14 | 10 | 28 | 12 | 3.1 | 1.3 | 134 | 2 | 13 |
| 31... | 1730 | 19 | 3.5 | 13 | 30 | 25 | 11 | 2.9 | 1.4 | 123 | -- | 13 |
| APR. | | | | | | | | | | | | |
| 07... | 1730 | 49 | 3.5 | 12 | 20 | 23 | 9.5 | 2.2 | 1.2 | 103 | 0 | 21 |
| 15... | 1730 | 107 | 4.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 26... | 1730 | 360 | 3.5 | 11 | 30 | 16 | 6.9 | 1.6 | .9 | 78 | 0 | 9.3 |
| MAY | | | | | | | | | | | | |
| 05... | 1730 | 868 | 5.5 | 10 | 40 | 15 | 6.2 | 1.4 | .4 | 70 | 0 | 14 |
| 14... | 1030 | 536 | 4.5 | -- | 50 | -- | 6.8 | -- | -- | -- | -- | -- |
| 21... | 1730 | 260 | 6.5 | 10 | 30 | 19 | 7.7 | 1.6 | .4 | 90 | 0 | 12 |
| JUNE | | | | | | | | | | | | |
| 07... | 1730 | 216 | 14.0 | 10 | 10 | 18 | 7.7 | 1.6 | .6 | 95 | 0 | 9.5 |
| 10... | 1000 | 188 | 9.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 26... | 1230 | 75 | 11.5 | 12 | 20 | 23 | 9.0 | 2.1 | .7 | 117 | 0 | 12 |
| JULY | | | | | | | | | | | | |
| 07... | 1730 | 47 | 16.0 | 18 | 10 | 26 | 11 | 2.0 | .6 | 123 | 0 | 13 |
| 09... | 1200 | 46 | 10.5 | -- | 30 | -- | 10 | -- | -- | -- | -- | -- |
| 30... | 1720 | 28 | 19.5 | 32 | 10 | 26 | 11 | 2.2 | .8 | 132 | 0 | 13 |
| AUG. | | | | | | | | | | | | |
| 07... | 1225 | 24 | 17.5 | 14 | 10 | 28 | 11 | 2.7 | .7 | 141 | 0 | 12 |
| 25... | 1715 | 17 | 17.5 | 14 | 10 | 29 | 11 | 2.5 | .8 | 149 | 0 | 8.5 |
| SEP. | | | | | | | | | | | | |
| 13... | 1715 | 18 | 15.0 | 14 | 0 | 29 | 12 | 2.6 | 1.0 | 149 | 0 | 9.3 |
| 29... | 1730 | 19 | 9.0 | 13 | 0 | 29 | 12 | 2.5 | 1.0 | 141 | 0 | .8 |

12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971.
Water temperatures: October 1970 to September 1971.

EXTREMES.--1970-71:
Water temperatures: Maximum, 21.5°C Aug. 8; minimum, freezing point on many days during November to April.

REMARKS.--Thermograph recorder installed Nov. 25, recorder stopped Jan. 18-20.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 02... | 1.6 | .1 | -- | -- | 150 | .21 | 8.32 | 130 | 8 | .1 | 254 | 8.1 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 2.2 | .1 | -- | -- | 137 | .19 | 7.51 | 120 | 11 | .1 | 229 | 8.1 |
| NOV. | | | | | | | | | | | | |
| 18... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.1 |
| 19... | .8 | .2 | -- | -- | 105 | .15 | 5.00 | 87 | 4 | .1 | 159 | 8.2 |
| 30... | 1.0 | .3 | -- | -- | 135 | .21 | 7.34 | 110 | 5 | .1 | 225 | 8.1 |
| DEC. | | | | | | | | | | | | |
| 01... | 1.0 | .1 | -- | -- | 134 | .19 | 6.80 | 120 | 6 | .1 | 237 | 8.1 |
| 24... | .7 | .1 | -- | -- | 128 | .19 | 5.18 | 110 | 5 | .1 | 228 | 8.1 |
| JAN. | | | | | | | | | | | | |
| 04... | .8 | .1 | .00 | .05 | 140 | .19 | 5.67 | 130 | 9 | .1 | 241 | 8.2 |
| 21... | 8.6 | -- | .30 | .00 | -- | -- | -- | -- | -- | -- | 226 | -- |
| 27... | .7 | 1.4 | .10 | .05 | 120 | .16 | 3.89 | 110 | 5 | .1 | 208 | 8.2 |
| FEB. | | | | | | | | | | | | |
| 09... | .7 | .3 | .10 | .00 | 140 | .19 | 8.69 | 110 | 0 | .1 | 213 | 8.4 |
| 26... | .5 | .3 | .10 | .06 | 136 | .19 | 6.61 | 110 | 0 | .1 | 213 | 8.4 |
| MAR. | | | | | | | | | | | | |
| 06... | .9 | .1 | .00 | .00 | 142 | .19 | 8.82 | 120 | 6 | .1 | 242 | 8.4 |
| 31... | 1.0 | .1 | .10 | .03 | 128 | .17 | 6.57 | 110 | 7 | .1 | 224 | 8.2 |
| APR. | | | | | | | | | | | | |
| 07... | 1.5 | .1 | .01 | .03 | 121 | .16 | 16.0 | 96 | 12 | .1 | 218 | 8.0 |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 179 | 7.7 |
| 26... | .6 | .1 | .03 | .03 | 85 | .12 | 82.6 | 68 | 4 | .1 | 141 | 7.8 |
| MAY | | | | | | | | | | | | |
| 05... | .6 | .1 | .00 | .03 | 82 | .11 | 192 | 63 | 6 | .1 | 128 | 7.8 |
| 14... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | .7 | .1 | .01 | .03 | 96 | .13 | 67.4 | 79 | 5 | .1 | 155 | 7.9 |
| JUNE | | | | | | | | | | | | |
| 07... | .2 | .0 | .02 | .03 | 94 | .13 | 54.8 | 77 | 0 | .1 | 158 | 8.1 |
| 10... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 168 | 7.7 |
| 26... | 1.5 | .3 | .00 | .15 | 118 | .16 | 23.9 | 94 | 0 | .1 | 182 | 8.0 |
| JULY | | | | | | | | | | | | |
| 07... | 6.2 | .6 | .44 | .03 | 140 | .19 | 17.8 | 110 | 9 | .1 | 202 | 8.0 |
| 09... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 204 | 7.9 |
| 30... | 1.0 | .5 | .40 | .06 | 169 | .23 | 12.8 | 110 | 2 | .1 | 220 | 8.0 |
| AUG. | | | | | | | | | | | | |
| 07... | .6 | .0 | .00 | .03 | 138 | .19 | 8.94 | 120 | 0 | .1 | 229 | 7.7 |
| 25... | .9 | .0 | .00 | .03 | 140 | .19 | 6.43 | 120 | 0 | .1 | 235 | 8.1 |
| SEP. | | | | | | | | | | | | |
| 13... | 2.0 | .1 | .02 | .03 | 143 | .19 | 6.95 | 120 | 0 | .1 | 239 | 8.1 |
| 29... | 1.8 | .1 | .01 | .03 | 130 | .18 | 6.67 | 120 | 6 | .1 | 232 | 8.1 |

12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 02... | 0900 | 20 | 0 | -- | -- |
| 15... | 1230 | 21 | 0 | 0 | .02 |
| 23... | 0800 | 20 | 0 | -- | -- |
| NOV. | | | | | |
| 18... | 1100 | 17 | -- | 48 | .03 |
| 19... | 1300 | 17 | 0 | -- | -- |
| 30... | 0900 | 18 | 0 | -- | -- |
| DEC. | | | | | |
| 01... | 1520 | 18 | 10 | -- | -- |
| 10... | 1200 | 16 | -- | -- | .05 |
| 24... | 1730 | 14 | 0 | -- | -- |
| JAN. | | | | | |
| 04... | 1730 | 15 | -- | 0 | -- |
| 21... | 1500 | 19 | 40 | 0 | .00 |
| 27... | 1730 | 12 | -- | 30 | -- |
| FEB. | | | | | |
| 09... | 1530 | 23 | -- | 40 | -- |
| 11... | 1030 | 21 | -- | -- | .00 |
| 26... | 1730 | 18 | -- | 7 | -- |
| MAR. | | | | | |
| 06... | 1230 | 23 | -- | 0 | -- |
| 11... | 1620 | 17 | -- | -- | .01 |
| 31... | 1730 | 19 | -- | 0 | -- |
| APR. | | | | | |
| 07... | 1730 | 49 | -- | 10 | -- |
| 15... | 1730 | 107 | -- | -- | .00 |
| 26... | 1730 | 360 | -- | 0 | -- |
| MAY | | | | | |
| 05... | 1730 | 868 | -- | 0 | -- |
| 14... | 1030 | 536 | 30 | 0 | .00 |
| 21... | 1730 | 260 | -- | 0 | -- |
| JUNE | | | | | |
| 07... | 1730 | 216 | -- | 0 | -- |
| 10... | 1000 | 188 | -- | -- | .00 |
| 26... | 1230 | 75 | -- | 0 | -- |
| JULY | | | | | |
| 07... | 1730 | 47 | -- | 0 | -- |
| 09... | 1200 | 46 | 10 | 0 | .00 |
| 30... | 1720 | 28 | -- | 0 | -- |
| AUG. | | | | | |
| 06... | 1315 | 23 | -- | -- | .00 |
| 07... | 1225 | 24 | -- | 0 | -- |
| 25... | 1715 | 17 | -- | 10 | -- |
| SEP. | | | | | |
| 13... | 1715 | 18 | -- | 0 | -- |
| 16... | 1615 | 23 | -- | -- | .00 |
| 29... | 1730 | 19 | -- | 0 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | |
| 15... | 1230 | 21 | -- | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| JAN. | | | | | | | | | | |
| 21... | 1500 | 19 | .0 | 100 | 0 | 0 | 0 | 0 | -- | 4 |
| MAY | | | | | | | | | | |
| 14... | 1030 | 536 | 4.5 | 400 | 0 | 100 | 0 | 0 | 0 | 0 |
| JULY | | | | | | | | | | |
| 09... | 1200 | 46 | 10.5 | 200 | 4 | 200 | 0 | 0 | 0 | 1 |

12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) |
|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | |
| 15... | 1230 | 4.5 | 8.0 | 220 | 11.0 | 7.8 | 98 |
| NOV. | | | | | | | |
| 18... | 1100 | 2.0 | 3.0 | 230 | 12.0 | 8.1 | 110 |
| DEC. | | | | | | | |
| 10... | 1200 | 1.0 | -2.5 | 230 | 12.6 | 8.4 | 105 |
| JAN. | | | | | | | |
| 21... | 1500 | .0 | -6.5 | 208 | 12.6 | 8.3 | 107 |
| FEB. | | | | | | | |
| 11... | 1030 | .5 | 1.5 | 215 | 13.0 | 8.1 | 103 |
| MAR. | | | | | | | |
| 11... | 1620 | 3.0 | 3.0 | 225 | 12.0 | 8.3 | 107 |
| APR. | | | | | | | |
| 15... | 1730 | 4.5 | 15.0 | 175 | 11.6 | 7.8 | 72 |
| MAY | | | | | | | |
| 14... | 1030 | 4.5 | 7.5 | 140 | 10.0 | 7.8 | 61 |
| JUNE | | | | | | | |
| 10... | 1000 | 9.5 | 12.0 | 170 | 9.4 | 8.0 | 74 |
| JULY | | | | | | | |
| 09... | 1200 | 10.5 | 24.0 | 205 | 9.2 | 7.3 | 89 |
| AUG. | | | | | | | |
| 06... | 1315 | 13.5 | 30.0 | 245 | 9.2 | 8.5 | 115 |
| SEP. | | | | | | | |
| 16... | 1615 | 9.0 | 11.0 | 235 | 11.0 | 8.0 | 123 |

12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | --- | --- | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.5 | 0.0 | 0.0 |
| 2 | --- | --- | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 |
| 3 | --- | --- | --- | --- | 1.5 | 0.5 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 |
| 4 | --- | --- | --- | --- | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5 | --- | --- | --- | --- | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 | --- | --- | --- | --- | 2.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | --- | --- | --- | --- | 3.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 | --- | --- | --- | --- | 1.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 |
| 9 | --- | --- | --- | --- | 1.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| 10 | --- | --- | --- | --- | 1.5 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 4.0 | 0.0 |
| 11 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 3.5 | 0.0 |
| 12 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.5 | 4.0 | 1.0 |
| 13 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 3.5 | 1.0 |
| 14 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 1.0 | 4.5 | 0.5 |
| 15 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 4.5 | 0.5 |
| 16 | --- | --- | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 4.0 | 0.5 |
| 17 | --- | --- | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 3.0 | 0.5 |
| 18 | --- | --- | --- | --- | 0.0 | 0.0 | --- | --- | 2.0 | 0.0 | 2.0 | 0.5 |
| 19 | --- | --- | --- | --- | 0.0 | 0.0 | --- | --- | 2.0 | 0.0 | 4.5 | 0.5 |
| 20 | --- | --- | --- | --- | 0.0 | 0.0 | --- | --- | 1.0 | 0.0 | 5.5 | 0.0 |
| 21 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.5 |
| 22 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 |
| 23 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 3.5 | 0.5 |
| 24 | --- | --- | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 5.5 | 1.5 |
| 25 | --- | --- | 1.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 0.5 |
| 26 | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 1.0 |
| 27 | --- | --- | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 4.5 | 0.5 |
| 28 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 5.5 | 0.5 |
| 29 | --- | --- | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | --- | --- | 6.5 | 1.0 |
| 30 | --- | --- | 1.5 | 1.0 | 0.0 | 0.0 | 2.0 | 1.0 | --- | --- | 5.5 | 2.0 |
| 31 | --- | --- | --- | --- | 0.0 | 0.0 | 2.0 | 0.5 | --- | --- | 4.5 | 0.5 |
| MONTH | --- | --- | --- | --- | 3.0 | 0.0 | 2.0 | 0.0 | 3.0 | 0.0 | 6.5 | 0.0 |

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 6.0 | 0.5 | 8.5 | 4.0 | 8.5 | 7.0 | 16.5 | 9.0 | 21.0 | 11.0 | 15.0 | 9.5 |
| 2 | 5.5 | 0.5 | 8.5 | 4.5 | 11.0 | 6.5 | 14.0 | 10.0 | 20.0 | 11.0 | 15.0 | 10.5 |
| 3 | 5.5 | 0.5 | 8.5 | 4.5 | 10.0 | 8.5 | 15.5 | 8.5 | 19.5 | 11.5 | 15.0 | 10.0 |
| 4 | 6.5 | 0.5 | 8.0 | 4.5 | 10.0 | 8.5 | 15.5 | 8.5 | 21.0 | 12.0 | 16.0 | 9.0 |
| 5 | 8.0 | 0.5 | 7.0 | 5.0 | 9.0 | 8.0 | 16.5 | 9.0 | 20.0 | 12.0 | 17.0 | 9.0 |
| 6 | 8.0 | 0.5 | 6.0 | 4.5 | 9.0 | 8.0 | 14.0 | 10.0 | 19.0 | 12.0 | 15.0 | 9.5 |
| 7 | 4.5 | 1.0 | 9.0 | 4.5 | 13.5 | 8.0 | 15.5 | 8.0 | 21.0 | 13.5 | 16.0 | 9.5 |
| 8 | 5.5 | 0.5 | 8.0 | 4.5 | 14.0 | 10.0 | 16.5 | 9.0 | 21.5 | 11.5 | 16.5 | 8.5 |
| 9 | 4.5 | 0.5 | 9.0 | 5.0 | 13.5 | 9.0 | 16.5 | 10.0 | 21.0 | 11.0 | 16.0 | 8.5 |
| 10 | 3.0 | 0.5 | 9.0 | 5.5 | 13.5 | 9.5 | 18.0 | 11.0 | 20.5 | 10.5 | 17.0 | 8.5 |
| 11 | 3.0 | 0.0 | 10.0 | 5.0 | 14.5 | 9.0 | 16.5 | 10.0 | 21.0 | 10.5 | 14.0 | 9.0 |
| 12 | 5.5 | 0.5 | 10.5 | 5.5 | 15.5 | 9.0 | 17.0 | 9.0 | 20.5 | 10.0 | 15.0 | 8.0 |
| 13 | 6.0 | 0.5 | 9.5 | 6.0 | 14.0 | 10.5 | 18.0 | 9.0 | 21.0 | 10.0 | 15.0 | 9.5 |
| 14 | 6.5 | 1.0 | 7.0 | 4.5 | 14.0 | 9.5 | 18.5 | 9.5 | 18.0 | 11.0 | 13.0 | 8.0 |
| 15 | 4.0 | 1.5 | 9.5 | 4.5 | 13.5 | 8.5 | 19.0 | 9.0 | 19.0 | 10.5 | 10.5 | 7.0 |
| 16 | 5.0 | 1.0 | 8.5 | 6.0 | 14.0 | 8.5 | 20.0 | 10.0 | 18.5 | 10.5 | 10.5 | 7.0 |
| 17 | 3.0 | 1.5 | 6.0 | 4.5 | 13.0 | 8.5 | 20.0 | 11.5 | 19.0 | 10.0 | 10.0 | 6.5 |
| 18 | 4.5 | 1.5 | 5.5 | 3.5 | 13.5 | 9.5 | 20.0 | 11.0 | 19.0 | 10.0 | 10.5 | 5.5 |
| 19 | 6.5 | 1.0 | 8.0 | 4.5 | 14.5 | 10.0 | 20.0 | 10.5 | 19.5 | 10.0 | 9.5 | 6.0 |
| 20 | 4.5 | 3.0 | 6.5 | 4.5 | 15.5 | 9.5 | 18.5 | 11.0 | 19.0 | 10.0 | 8.0 | 5.5 |
| 21 | 5.0 | 3.0 | 6.5 | 5.0 | 17.0 | 10.0 | 21.0 | 12.0 | 19.5 | 10.0 | 10.0 | 4.5 |
| 22 | 4.5 | 3.5 | 7.0 | 5.0 | 19.0 | 11.5 | 19.0 | 12.0 | 19.0 | 10.0 | 10.5 | 5.0 |
| 23 | 5.5 | 3.0 | 8.5 | 5.0 | 18.0 | 11.5 | 20.0 | 11.0 | 16.5 | 10.0 | 11.5 | 5.0 |
| 24 | 4.5 | 3.5 | 10.5 | 6.5 | 18.0 | 11.0 | 19.0 | 11.5 | 19.0 | 9.0 | 10.5 | 5.5 |
| 25 | 3.5 | 2.0 | 11.5 | 6.5 | 16.0 | 11.0 | 19.5 | 11.5 | 16.5 | 9.0 | 9.5 | 6.5 |
| 26 | 4.0 | 1.5 | 11.0 | 8.0 | 12.0 | 10.0 | 20.0 | 10.0 | 19.0 | 9.0 | 10.0 | 5.5 |
| 27 | 4.5 | 1.0 | 13.5 | 8.5 | 14.5 | 10.0 | 16.0 | 10.5 | 20.5 | 10.0 | 10.0 | 6.5 |
| 28 | 6.0 | 3.5 | 13.0 | 9.5 | 10.5 | 9.0 | 14.5 | 11.0 | 21.0 | 11.0 | 9.5 | 6.0 |
| 29 | 6.5 | 3.5 | 10.5 | 9.0 | 11.5 | 8.0 | 19.0 | 9.5 | 15.0 | 12.0 | 8.5 | 5.5 |
| 30 | 8.0 | 3.5 | 9.5 | 8.0 | 15.5 | 8.0 | 19.5 | 10.0 | 15.0 | 13.0 | 7.0 | 6.0 |
| 31 | --- | --- | 8.0 | 6.5 | --- | --- | 19.5 | 10.0 | 16.0 | 11.5 | --- | --- |
| MONTH | 8.0 | 0.0 | 13.5 | 3.5 | 19.0 | 6.5 | 21.0 | 8.0 | 21.5 | 9.0 | 17.0 | 4.5 |
| YEAR | 21.5 | 0.0 | | | | | | | | | | |

12334650 BLACKFOOT RIVER BELOW ALICE CREEK, NEAR LINCOLN, MONT.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | TEMPERATURE (DEG C) | DISCHARGE (CFS) | SUSPENDED SEDIMENT (MG/L) | SUSPENDED SEDIMENT DISCHARGE (T/DAY) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 15... | 1230 | 4.5 | 21 | 7 | .40 |
| NOV. | | | | | |
| 18... | 1100 | 2.0 | 16 | 2 | .09 |
| DEC. | | | | | |
| 10... | 1200 | 1.0 | 16 | 1 | .04 |
| JAN. | | | | | |
| 21... | 1500 | .0 | 19 | 7 | .36 |
| FEB. | | | | | |
| 11... | 1030 | .5 | 22 | 4 | .24 |
| MAR. | | | | | |
| 11... | 1620 | 3.0 | 16 | 16 | .69 |
| APR. | | | | | |
| 15... | 1730 | 4.5 | 96 | 13 | 3.4 |
| MAY | | | | | |
| 16... | 1120 | 6.5 | 396 | 18 | 19 |
| JUNE | | | | | |
| 02... | 1205 | 9.0 | 296 | 5 | 4.0 |
| 10... | 1000 | 9.5 | 189 | 3 | 1.5 |
| JULY | | | | | |
| 09... | 1200 | 10.5 | 46 | 2 | .25 |
| AUG. | | | | | |
| 06... | 1315 | 13.5 | 23 | 1 | .06 |
| SEP. | | | | | |
| 16... | 1615 | 9.0 | 22 | 4 | .24 |

12340500 CLARK FORK ABOVE MISSOULA, MONT.

LOCATION.--Lat 46°52'01", long 113°58'57", in NE¼SW¼SE¼ sec.22, T.13 N., R.19 W., Missoula County, at abandoned Van Buren Street Bridge in Missoula, 0.1 mile upstream from Rattlesnake Creek, 3.4 miles downstream from gaging station, and at mile 358.3.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 07... | 0830 | 1880 | -- | 2.9 | 88 | 3.9 | .4 | 284 | .39 | 1440 | 220 | 4 |
| NOV. | | | | | | | | | | | | |
| 04... | 0730 | 1610 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 02... | 0900 | 1640 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 08... | 1000 | 1000 | 83 | 2.4 | 130 | 7.8 | .5 | 356 | .48 | 961 | 270 | 1 |
| FEB. | | | | | | | | | | | | |
| 02... | 1445 | 5300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 03... | 1730 | 2000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 07... | 1730 | 2630 | 71 | 2.7 | 140 | 1.9 | .6 | 350 | .48 | 2490 | 230 | 20 |
| MAY | | | | | | | | | | | | |
| 04... | 1720 | 10800 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 02... | 1700 | 13900 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 07... | 0830 | 1880 | 100 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 17 | 0 |
| NOV. | | | | | | | | | | | | |
| 04... | 0730 | 1610 | -- | -- | -- | -- | 10 | -- | -- | -- | 0 | 10 |
| DEC. | | | | | | | | | | | | |
| 02... | 0900 | 1640 | -- | -- | -- | -- | 10 | -- | -- | -- | 0 | 30 |
| JAN. | | | | | | | | | | | | |
| 08... | 1000 | 1000 | -- | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 2 | 100 |
| FEB. | | | | | | | | | | | | |
| 02... | 1445 | 5300 | -- | -- | -- | -- | 0 | -- | -- | -- | 11 | 200 |
| MAR. | | | | | | | | | | | | |
| 03... | 1730 | 2000 | -- | -- | -- | -- | 10 | -- | -- | -- | 32 | 140 |
| APR. | | | | | | | | | | | | |
| 07... | 1730 | 2630 | 200 | 0 | 200 | 0 | 30 | 0 | 0 | 4 | 24 | 30 |
| MAY | | | | | | | | | | | | |
| 04... | 1720 | 10800 | -- | -- | -- | -- | 10 | -- | -- | -- | 4 | 60 |
| JUNE | | | | | | | | | | | | |
| 02... | 1700 | 13900 | -- | -- | -- | -- | 20 | -- | -- | -- | 9 | 80 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 07... | 0830 | 1880 | 10 | 50 | 7 | 40 | -- | 270 | <10 |
| NOV. | | | | | | | | | |
| 04... | 0730 | 1610 | -- | -- | -- | -- | .2 | -- | -- |
| DEC. | | | | | | | | | |
| 02... | 0900 | 1640 | 10 | 100 | <1 | 70 | -- | 230 | 40 |
| JAN. | | | | | | | | | |
| 08... | 1000 | 1000 | -- | -- | -- | -- | 1.0 | -- | -- |
| FEB. | | | | | | | | | |
| 02... | 1445 | 5300 | 100 | 190 | 15 | 270 | -- | 130 | 210 |
| MAR. | | | | | | | | | |
| 03... | 1730 | 2000 | -- | -- | -- | -- | .3 | -- | -- |
| APR. | | | | | | | | | |
| 07... | 1730 | 2630 | 340 | 4200 | 66 | 450 | .2 | 190 | 540 |
| MAY | | | | | | | | | |
| 04... | 1720 | 10800 | -- | -- | -- | -- | .1 | -- | -- |
| JUNE | | | | | | | | | |
| 02... | 1700 | 13900 | 10 | 630 | 9 | 90 | .3 | 60 | <10 |

12340500 CLARK FORK ABOVE MISSOULA, MONT.--Continued

DRAINAGE AREA.--5,999 sq mi (at gaging station).

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 07... | 2 | .00 | .010 | -- | .03 | .22 | .050 | .09 | .060 | 25 | -- |
| NOV. | | | | | | | | | | | |
| 04... | -- | .1 | -- | -- | .02 | -- | .010 | .01 | .020 | .0 | .8 |
| DEC. | | | | | | | | | | | |
| 02... | -- | .2 | -- | -- | .01 | -- | .010 | .01 | .020 | 4.0 | .8 |
| JAN. | | | | | | | | | | | |
| 08... | 1 | -- | .020 | .30 | .00 | .02 | -- | .00 | -- | .0 | 1.1 |
| FEB. | | | | | | | | | | | |
| 02... | -- | -- | -- | .40 | .08 | -- | -- | .20 | .20 | 4.0 | 3.2 |
| MAR. | | | | | | | | | | | |
| 03... | -- | -- | -- | .10 | .05 | -- | -- | .10 | .050 | 2.0 | .9 |
| APR. | | | | | | | | | | | |
| 07... | 5 | .00 | .010 | .00 | .26 | .20 | .020 | .06 | .090 | 1.0 | 1.0 |
| MAY | | | | | | | | | | | |
| 04... | -- | -- | -- | .10 | .00 | -- | -- | .09 | .060 | 7.0 | 1.7 |
| JUNE | | | | | | | | | | | |
| 02... | -- | -- | -- | .03 | .08 | -- | -- | .12 | .090 | 48 | .8 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 07... | 0 | -- | 22 | .0 | 2 | 0 | 0 | 1 | 320 | .4 | 10 |
| NOV. | | | | | | | | | | | |
| 04... | 0 | -- | 25 | .9 | -- | -- | -- | -- | 340 | -- | 20 |
| DEC. | | | | | | | | | | | |
| 02... | 0 | -- | 77 | .2 | -- | -- | -- | -- | 380 | -- | 10 |
| JAN. | | | | | | | | | | | |
| 08... | 0 | 16 | 0 | -- | 2 | 0 | 0 | 0 | 270 | 2.0 | 40 |
| FEB. | | | | | | | | | | | |
| 02... | 3 | -- | 200 | .4 | -- | -- | -- | -- | 120 | -- | 40 |
| MAR. | | | | | | | | | | | |
| 03... | 0 | -- | 94 | .2 | -- | -- | -- | -- | 350 | -- | 40 |
| APR. | | | | | | | | | | | |
| 07... | 0 | 12 | 100 | .2 | 0 | 10 | 0 | 1 | 220 | .0 | 40 |
| MAY | | | | | | | | | | | |
| 04... | 0 | -- | 30 | .1 | -- | -- | -- | -- | 120 | -- | 5 |
| JUNE | | | | | | | | | | | |
| 02... | 0 | -- | 0 | .2 | -- | -- | -- | -- | 210 | -- | 20 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 07... | 0830 | 7.0 | -.5 | 420 | 12.2 | 8.2 | 134 | 260 | 70 |
| NOV. | | | | | | | | | |
| 04... | 0730 | 2.0 | 1.5 | 520 | 12.1 | 8.1 | 131 | 160 | 120 |
| DEC. | | | | | | | | | |
| 02... | 0900 | 2.0 | .0 | 500 | 12.0 | 8.2 | 125 | -- | 350 |
| 04... | 1430 | -- | -- | -- | -- | -- | -- | 10 | -- |
| JAN. | | | | | | | | | |
| 08... | 1000 | .5 | 3.5 | 535 | 12.1 | 7.5 | 138 | 370 | 48 |
| FEB. | | | | | | | | | |
| 02... | 1445 | 1.5 | 5.0 | 350 | 12.4 | 8.3 | 87 | 100 | 32 |
| MAR. | | | | | | | | | |
| 03... | 1730 | .5 | .0 | 470 | 12.8 | 8.3 | 110 | 26 | 0 |
| APR. | | | | | | | | | |
| 07... | 1730 | 8.0 | 8.5 | 475 | 11.8 | 8.3 | 105 | 33 | 13 |
| MAY | | | | | | | | | |
| 04... | 1720 | 10.5 | 23.0 | 205 | 10.3 | 8.1 | 72 | 480 | 430 |
| JUNE | | | | | | | | | |
| 02... | 1700 | 11.0 | 16.0 | 215 | 10.7 | 7.5 | 75 | -- | 50 |
| 03... | 1600 | 11.5 | -- | -- | -- | -- | -- | 2600 | 23 |

## 12352980 BITTERROOT RIVER AT MACLAY BRIDGE, NEAR MISSOULA, MONT.

LOCATION.--Lat 46°51'12", long 114°05'48", in SE¼NW¼SW¼ sec.26, T.13 N., R.20 W., Missoula County, at Maclay Bridge on county road, 1.5 miles upstream from mouth and 5.2 miles west of the Missoula Post Office.

DRAINAGE AREA.--2,850 sq mi.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 06... | 1630 | 960 | -- | -- | 5.8 | 3.0 | .2 | 110 | .15 | 285 | 80 | 2 |
| NOV. | | | | | | | | | | | | |
| 03... | 1450 | 1100 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 01... | 1315 | 1350 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 07... | 1400 | 640 | 21 | -- | 9.8 | 1.8 | .2 | 104 | .14 | 180 | 72 | -- |
| FEB. | | | | | | | | | | | | |
| 02... | 1810 | 4980 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 04... | 0900 | 1520 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 08... | 0930 | 2480 | 13 | -- | 6.8 | -- | -- | 77 | .10 | 516 | 46 | -- |
| MAY | | | | | | | | | | | | |
| 04... | 1410 | 9300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 03... | 1400 | 14500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 24... | 1530 | 2160 | 14 | 1.1 | -- | -- | .3 | -- | -- | -- | 50 | 1 |
| AUG. | | | | | | | | | | | | |
| 17... | 1530 | 760 | -- | -- | -- | -- | .2 | -- | -- | -- | -- | 1 |
| SEP. | | | | | | | | | | | | |
| 16... | 0830 | 870 | -- | -- | -- | -- | .4 | -- | -- | -- | -- | 1 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN. | | | | | | | | | | | | |
| 07... | 1400 | 640 | -- | -- | -- | -- | 100 | -- | 4.8 | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 08... | 0930 | 2480 | -- | -- | -- | -- | -- | -- | 3.2 | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 24... | 1530 | 2160 | 0 | 0 | 0 | 2 | 30 | 0 | 3.6 | .0 | 0 | 0 |
| AUG. | | | | | | | | | | | | |
| 17... | 1530 | 760 | -- | -- | -- | -- | 20 | -- | -- | .2 | -- | 10 |
| SEP. | | | | | | | | | | | | |
| 16... | 0830 | 870 | -- | -- | -- | -- | 20 | -- | -- | .1 | -- | 0 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL CHRO-MIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JULY | | | | | | | | | | |
| 24... | 1530 | 2160 | 0 | <1 | 0 | <10 | 10 | <1 | .0 | <10 |

12352980 BITTERROOT RIVER AT MACLAY BRIDGE, NEAR MISSOULA, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1970 to September 1971.

REMARKS.--Water discharge computed by subtracting the discharge of Clark Fork above Missoula from that of Clark Fork below Missoula.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 06... | 2 | .1 | .000 | -- | .04 | .18 | .040 | .10 | .050 | 3.0 | -- |
| NOV. | | | | | | | | | | | |
| 03... | -- | .5 | .000 | -- | .02 | .14 | -- | -- | .010 | 36 | 1.0 |
| DEC. | | | | | | | | | | | |
| 01... | -- | .00 | .010 | -- | .02 | .19 | .010 | .00 | .010 | 1.0 | 1.5 |
| JAN. | | | | | | | | | | | |
| 07... | -- | -- | .020 | .10 | .00 | .05 | -- | .01 | -- | .0 | 1.2 |
| FEB. | | | | | | | | | | | |
| 02... | -- | -- | .000 | .50 | .02 | -- | .080 | .12 | .070 | 5.0 | 1.3 |
| MAR. | | | | | | | | | | | |
| 04... | -- | -- | .000 | .20 | .02 | .00 | .020 | .03 | .030 | 1.0 | .6 |
| APR. | | | | | | | | | | | |
| 08... | 0 | .4 | .000 | .40 | .43 | .32 | .10 | .25 | -- | 5.0 | .8 |
| MAY | | | | | | | | | | | |
| 04... | -- | .4 | .000 | .40 | .15 | .28 | .13 | .06 | .13 | 8.0 | 2.2 |
| JUNE | | | | | | | | | | | |
| 03... | -- | .00 | .000 | .03 | .07 | .19 | .040 | .09 | .070 | 2.0 | .7 |
| JULY | | | | | | | | | | | |
| 24... | 7 | .00 | .000 | .03 | .07 | -- | .040 | .06 | .050 | 6.0 | .7 |
| AUG. | | | | | | | | | | | |
| 17... | 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | .9 |
| SEP. | | | | | | | | | | | |
| 16... | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.4 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 06... | 1630 | 10.5 | 6.5 | 180 | 11.9 | 8.0 | 84 | 82 | 8 |
| NOV. | | | | | | | | | |
| 03... | 1450 | 5.0 | 12.5 | 160 | 12.2 | 8.0 | 79 | 24 | 3 |
| DEC. | | | | | | | | | |
| 01... | 1315 | 4.0 | 2.5 | 150 | 12.7 | 7.6 | 64 | -- | 12 |
| 04... | 1050 | -- | -- | -- | -- | -- | -- | 380 | -- |
| JAN. | | | | | | | | | |
| 07... | 1400 | .5 | 6.0 | 175 | 13.2 | 7.9 | 80 | 240 | 47 |
| FEB. | | | | | | | | | |
| 02... | 1810 | 2.5 | 4.0 | 60 | 12.4 | 6.8 | 23 | 520 | 140 |
| MAR. | | | | | | | | | |
| 04... | 0900 | 1.0 | -2.5 | 130 | 12.3 | 7.6 | 53 | 7 | 4 |
| APR. | | | | | | | | | |
| 08... | 0930 | 6.0 | 5.5 | 115 | 12.0 | 7.6 | 43 | 180 | 8 |
| MAY | | | | | | | | | |
| 04... | 1410 | 10.0 | 24.0 | 60 | 10.8 | 7.9 | 32 | 2900 | 300 |
| JUNE | | | | | | | | | |
| 03... | 1400 | 10.5 | 21.0 | 60 | 10.1 | 6.5 | -- | 80 | 130 |
| JULY | | | | | | | | | |
| 24... | 1530 | 20.0 | 30.0 | 120 | 9.2 | 8.0 | 54 | 380 | 22 |
| AUG. | | | | | | | | | |
| 17... | 1530 | 20.0 | 30.5 | 192 | 10.2 | 8.1 | 92 | 1000 | 50 |
| SEP. | | | | | | | | | |
| 16... | 0830 | 11.5 | 6.0 | 205 | 9.6 | 7.4 | 130 | 36 | 2 |

## 12353300 CLARK FORK NEAR ALBERTON, MONT.

LOCATION.--Lat 46°59'33", long 114°26'45", in S½SE¼ sec.1, T.14 N., R.23 W., Missoula County, at bridge 0.1 mile upstream from Petty Creek, 0.2 mile downstream from former gaging station, 1.7 miles east of Alberton, and at mile 319.8.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 06... | 1230 | 2880 | -- | 58 | 3.0 | .5 | 219 | .30 | 1700 | 160 | 4 |
| NOV. | | | | | | | | | | | |
| 03... | 1200 | 2900 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | |
| 01... | 1610 | 3230 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | |
| 07... | 0930 | 1510 | 55 | 59 | 5.5 | .3 | 230 | .31 | 938 | 180 | -- |
| FEB. | | | | | | | | | | | |
| 02... | 1200 | 12100 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | |
| 03... | 1300 | 3590 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | |
| 07... | 1245 | 4790 | 47 | 79 | 1.8 | -- | 198 | .27 | 2560 | 150 | 20 |
| MAY | | | | | | | | | | | |
| 04... | 1100 | 20500 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | |
| 03... | 0930 | 29200 | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 06... | 1230 | 2880 | 30 | 0 | 0 | 0 | -- | 31 | .0 | 280 | 20 |
| NOV. | | | | | | | | | | | |
| 03... | 1200 | 2900 | 10 | 0 | 10 | 0 | -- | 51 | .2 | 280 | 10 |
| DEC. | | | | | | | | | | | |
| 01... | 1610 | 3230 | 10 | 0 | 10 | 0 | -- | 54 | .0 | 340 | 20 |
| JAN. | | | | | | | | | | | |
| 07... | 0930 | 1510 | 20 | 2 | 160 | 0 | 11 | 0 | -- | 180 | 20 |
| FEB. | | | | | | | | | | | |
| 02... | 1200 | 12100 | 330 | 20 | 210 | 2 | -- | 61 | .3 | 150 | 50 |
| MAR. | | | | | | | | | | | |
| 03... | 1300 | 3590 | 80 | 42 | 200 | 6 | -- | 280 | .3 | 270 | 54 |
| APR. | | | | | | | | | | | |
| 07... | 1245 | 4790 | 20 | 10 | -- | 2 | 8.9 | 80 | .2 | 240 | 30 |
| MAY | | | | | | | | | | | |
| 04... | 1100 | 20500 | 10 | 4 | 40 | 1 | -- | 60 | .1 | 90 | 0 |
| JUNE | | | | | | | | | | | |
| 03... | 0930 | 29200 | 20 | 7 | 100 | 2 | -- | 0 | .1 | 260 | 20 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 06... | 1230 | 2880 | <10 | 110 | 2 | 40 | -- | 200 | <10 |
| NOV. | | | | | | | | | |
| 03... | 1200 | 2900 | -- | -- | -- | -- | .2 | -- | -- |
| DEC. | | | | | | | | | |
| 01... | 1610 | 3230 | -- | -- | -- | -- | <.1 | -- | -- |
| JAN. | | | | | | | | | |
| 07... | 0930 | 1510 | <10 | <10 | 5 | 40 | .1 | 40 | 220 |
| FEB. | | | | | | | | | |
| 02... | 1200 | 12100 | -- | -- | -- | -- | .1 | -- | -- |
| MAR. | | | | | | | | | |
| 03... | 1300 | 3590 | -- | -- | -- | -- | .3 | -- | -- |
| APR. | | | | | | | | | |
| 07... | 1245 | 4790 | 240 | 1900 | 40 | 210 | -- | 130 | 260 |
| MAY | | | | | | | | | |
| 04... | 1100 | 20500 | -- | -- | -- | -- | .1 | -- | -- |
| JUNE | | | | | | | | | |
| 03... | 0930 | 29200 | -- | -- | -- | -- | .2 | -- | -- |

12353300 CLARK FORK NEAR ALBERTON, MONT.--Continued

DRAINAGE AREA.--9,272 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

REMARKS.--Water discharge estimated from records for station 12354500, Clark Fork at St. Regis.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 06... | 3 | .00 | .010 | -- | .02 | .22 | .020 | .04 | .040 | 2.0 | -- |
| NOV. | | | | | | | | | | | |
| 03... | -- | .5 | -- | -- | .01 | -- | .020 | .03 | .020 | 54 | 1.6 |
| DEC. | | | | | | | | | | | |
| 01... | -- | .1 | -- | -- | .01 | -- | .030 | .04 | .080 | .0 | 1.5 |
| JAN. | | | | | | | | | | | |
| 07... | 2 | -- | .020 | .10 | .06 | .02 | -- | .03 | -- | 20 | .8 |
| FEB. | | | | | | | | | | | |
| 02... | -- | -- | -- | .50 | .00 | -- | -- | .23 | .20 | 4.0 | 3.0 |
| MAR. | | | | | | | | | | | |
| 03... | -- | -- | -- | .10 | .05 | -- | -- | .10 | .070 | .0 | .8 |
| APR. | | | | | | | | | | | |
| 07... | 5 | .1 | .030 | .10 | .27 | .20 | .020 | .12 | .20 | 2.0 | 1.2 |
| MAY | | | | | | | | | | | |
| 04... | -- | -- | -- | .10 | .08 | -- | -- | .12 | .20 | 4.0 | 2.4 |
| JUNE | | | | | | | | | | | |
| 03... | -- | -- | -- | .01 | .01 | -- | -- | .12 | .070 | .0 | .9 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 06... | 1230 | 10.5 | 6.5 | 380 | 11.0 | 7.9 | 116 | 26 | 20 |
| NOV. | | | | | | | | | |
| 03... | 1200 | 3.5 | 5.0 | 385 | 12.6 | 8.1 | 116 | 38 | 1 |
| DEC. | | | | | | | | | |
| 01... | 1610 | 3.0 | 2.0 | 360 | 12.8 | 8.1 | 92 | -- | 0 |
| 04... | 1325 | -- | -- | -- | -- | -- | -- | 42 | -- |
| JAN. | | | | | | | | | |
| 07... | 0930 | 1.5 | 3.0 | 340 | 11.6 | 7.8 | 121 | 10 | 7 |
| FEB. | | | | | | | | | |
| 02... | 1200 | 2.5 | 5.0 | 200 | 12.4 | 7.3 | 49 | 150 | 74 |
| MAR. | | | | | | | | | |
| 03... | 1300 | 1.5 | 2.5 | 335 | 12.2 | 8.0 | 97 | 40 | 0 |
| APR. | | | | | | | | | |
| 07... | 1245 | 8.5 | 9.0 | 325 | 10.6 | 7.9 | 80 | 27 | 15 |
| MAY | | | | | | | | | |
| 04... | 1100 | 10.0 | 20.5 | 145 | 10.0 | 7.8 | 43 | 2000 | 150 |
| JUNE | | | | | | | | | |
| 03... | 0930 | 10.5 | 12.5 | 135 | 10.2 | 7.3 | 51 | 330 | 55 |

## 12359800 SOUTH FORK FLATHEAD RIVER ABOVE TWIN CREEK, NEAR HUNGRY HORSE, MONT.

LOCATION.--Lat 47°58'45", long 113°33'36", in NE¼NW¼NE¼ sec.36, T.26 N., R.16 W., Flathead County, Flathead National Forest, temperature recorder at gaging station on left bank 0.1 mile downstream from Tin Creek, 0.4 mile upstream from Twin Creek, 36.3 miles southeast of Hungry Horse, and at mile 46.7.

DRAINAGE AREA.--1,160 sq mi.

PERIOD OF RECORD.--Water temperatures: May 1965 to September 1971.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 9.5 | 7.5 | 3.0 | 1.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.5 | 0.5 |
| 2 | 9.5 | 7.5 | 3.0 | 1.5 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.5 | 0.5 | 0.5 |
| 3 | 10.0 | 7.5 | 2.5 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.5 | 0.5 |
| 4 | 10.0 | 7.5 | 2.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.5 | 0.5 |
| 5 | 9.0 | 6.5 | 2.0 | 1.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 |
| 6 | 7.0 | 6.0 | 3.0 | 2.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 |
| 7 | 6.0 | 5.0 | 4.0 | 3.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 |
| 8 | 5.0 | 4.5 | 4.0 | 3.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 0.5 |
| 9 | 5.5 | 5.0 | 4.0 | 3.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 |
| 10 | 6.0 | 5.0 | 4.0 | 3.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.5 | 0.0 | 2.0 | 1.5 |
| 11 | 6.0 | 5.5 | 3.5 | 3.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.5 | 0.5 | 2.5 | 1.5 |
| 12 | 7.0 | 6.0 | 3.5 | 3.0 | 1.0 | 0.5 | 0.0 | 0.0 | 2.0 | 1.5 | 2.5 | 1.0 |
| 13 | 6.5 | 5.5 | 3.5 | 3.5 | 0.5 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.5 | 2.0 |
| 14 | 6.0 | 5.0 | 3.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 2.0 | 3.0 | 1.5 |
| 15 | 5.5 | 4.0 | 3.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 2.5 | 3.0 | 1.5 |
| 16 | 5.0 | 3.0 | 2.5 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 2.0 | 2.0 | 1.0 |
| 17 | 5.0 | 3.0 | 3.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.5 | 2.0 | 0.5 |
| 18 | 5.0 | 3.0 | 3.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.5 | 2.0 | 0.5 |
| 19 | 5.5 | 4.5 | 2.5 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.5 | 2.0 | 0.5 |
| 20 | 6.0 | 5.0 | 2.5 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.0 | 1.0 | 0.5 |
| 21 | 6.0 | 5.0 | 1.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 2.0 | 0.5 |
| 22 | 6.0 | 5.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.5 |
| 23 | 5.5 | 5.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.0 | 1.5 | 0.5 |
| 24 | 5.5 | 5.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 | 4.0 | 1.0 |
| 25 | 5.0 | 4.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.5 | 4.0 | 2.0 |
| 26 | 4.0 | 3.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 1.0 | 3.5 | 2.0 |
| 27 | 4.5 | 3.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 3.5 | 1.5 |
| 28 | 3.5 | 2.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 | 3.5 | 2.0 |
| 29 | 3.0 | 2.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 4.5 | 2.5 |
| 30 | 3.0 | 1.5 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 4.0 | 3.0 |
| 31 | 3.0 | 1.5 | --- | --- | 0.0 | 0.0 | 0.0 | 0.0 | --- | --- | 3.5 | 2.5 |
| MONTH | 10.0 | 1.5 | 4.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 4.5 | 0.5 |

12359800 SOUTH FORK FLATHEAD RIVER ABOVE TWIN CREEK, NEAR HUNGRY HORSE, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 16.5°C Aug. 22, 28; minimum, freezing point on many days during December to February.

Period of record:
Water temperatures: Maximum, 19.0°C Aug. 17-19, 1967; minimum, freezing point on many days during winter periods of most years.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 4.0 | 1.5 | 5.0 | 3.5 | 6.0 | 5.0 | 9.0 | 7.5 | 14.0 | 12.5 | 13.0 | 11.5 |
| 2 | 3.0 | 2.0 | 5.0 | 3.5 | 6.0 | 5.5 | 9.0 | 8.0 | 14.5 | 13.0 | 12.0 | 10.0 |
| 3 | 4.0 | 2.0 | 4.5 | 3.5 | 6.5 | 5.5 | 8.5 | 7.0 | 14.5 | 13.5 | 11.5 | 10.5 |
| 4 | 5.0 | 2.0 | 4.5 | 3.0 | 6.5 | 6.0 | 9.0 | 7.5 | 15.0 | 13.0 | 11.0 | 10.0 |
| 5 | 5.5 | 2.0 | 4.0 | 3.0 | 6.0 | 5.5 | 9.0 | 8.0 | 15.5 | 14.0 | 13.0 | 9.5 |
| 6 | 6.0 | 3.0 | 3.5 | 3.0 | 6.0 | 5.5 | 9.0 | 8.0 | 15.0 | 14.0 | 13.0 | 10.5 |
| 7 | 4.5 | 4.0 | 5.0 | 3.0 | 7.0 | 5.5 | 9.0 | 7.0 | 16.0 | 13.5 | 13.0 | 10.5 |
| 8 | 5.0 | 3.0 | 4.5 | 3.0 | 7.0 | 6.0 | 10.0 | 8.0 | 16.0 | 14.0 | 13.0 | 9.5 |
| 9 | 4.5 | 3.5 | 4.5 | 3.5 | 7.0 | 6.0 | 11.0 | 9.5 | 16.0 | 14.0 | 12.0 | 9.5 |
| 10 | 4.0 | 3.0 | 4.5 | 3.0 | 7.0 | 6.0 | 11.0 | 9.0 | 15.5 | 13.5 | 13.0 | 9.5 |
| 11 | 3.5 | 2.0 | 5.0 | 3.0 | 6.5 | 6.0 | 10.0 | 8.5 | 16.0 | 13.0 | 12.0 | 10.0 |
| 12 | 4.5 | 2.0 | 5.0 | 3.0 | 8.0 | 6.0 | 10.0 | 8.5 | 16.0 | 13.5 | 12.0 | 9.0 |
| 13 | 5.0 | 3.0 | 4.5 | 3.5 | 8.0 | 6.5 | 10.5 | 9.0 | 16.0 | 13.0 | 11.5 | 9.5 |
| 14 | 5.5 | 3.5 | 4.0 | 3.5 | 7.5 | 6.5 | 11.0 | 9.0 | 16.0 | 13.5 | 11.0 | 8.5 |
| 15 | 5.0 | 4.0 | 4.5 | 3.5 | 7.5 | 5.5 | 11.0 | 9.5 | 16.0 | 12.5 | 10.5 | 8.5 |
| 16 | 4.0 | 3.0 | 4.5 | 4.0 | 7.0 | 6.0 | 12.0 | 10.0 | 16.0 | 13.0 | 10.0 | 8.5 |
| 17 | 4.0 | 3.0 | 4.0 | 3.5 | 8.0 | 6.0 | 12.0 | 11.0 | 16.0 | 13.0 | 10.0 | 7.5 |
| 18 | 4.0 | 3.0 | 4.5 | 3.5 | 8.0 | 7.0 | 12.0 | 11.0 | 15.5 | 12.5 | 9.5 | 6.5 |
| 19 | 5.0 | 3.0 | 4.5 | 4.0 | 7.5 | 7.0 | 12.0 | 10.5 | 16.0 | 12.5 | 8.5 | 7.0 |
| 20 | 5.0 | 4.0 | 4.5 | 4.0 | 8.5 | 7.0 | 12.5 | 11.0 | 16.0 | 12.5 | 8.5 | 8.0 |
| 21 | 4.5 | 4.0 | 4.5 | 4.0 | 9.0 | 7.0 | 12.5 | 11.5 | 16.0 | 13.0 | 8.5 | 6.0 |
| 22 | 5.0 | 4.0 | 5.5 | 4.0 | 9.0 | 7.0 | 13.0 | 12.0 | 16.5 | 13.0 | 8.5 | 6.0 |
| 23 | 5.0 | 3.5 | 6.0 | 4.5 | 9.0 | 7.5 | 13.0 | 11.5 | 15.0 | 13.0 | 9.5 | 6.5 |
| 24 | 4.5 | 3.5 | 6.0 | 4.5 | 9.0 | 7.0 | 13.0 | 12.0 | 14.0 | 11.0 | 9.5 | 7.0 |
| 25 | 3.5 | 3.0 | 6.0 | 4.0 | 8.5 | 7.5 | 12.5 | 10.5 | 14.5 | 11.5 | 8.5 | 7.0 |
| 26 | 3.0 | 2.5 | 6.0 | 4.0 | 8.0 | 6.5 | 12.5 | 11.0 | 15.0 | 11.5 | 8.5 | 7.5 |
| 27 | 3.0 | 2.5 | 6.0 | 4.0 | 8.0 | 7.0 | 12.5 | 11.5 | 15.5 | 12.0 | 8.0 | 7.0 |
| 28 | 3.5 | 3.0 | 6.5 | 4.5 | 7.0 | 6.0 | 12.0 | 10.5 | 16.5 | 13.0 | 8.0 | 7.0 |
| 29 | 4.0 | 3.0 | 6.0 | 5.5 | 6.0 | 6.0 | 12.0 | 10.0 | 15.5 | 13.5 | 8.0 | 6.5 |
| 30 | 4.5 | 3.0 | 6.0 | 5.5 | 8.5 | 6.0 | 13.0 | 11.5 | 15.0 | 14.0 | 7.5 | 6.0 |
| 31 | --- | --- | 5.5 | 5.0 | --- | --- | 14.0 | 12.0 | 14.0 | 12.5 | --- | --- |
| MONTH | 6.0 | 1.5 | 6.5 | 3.0 | 9.0 | 5.0 | 14.0 | 7.0 | 16.5 | 11.0 | 13.0 | 6.0 |
| YEAR | 16.5 | 0.0 | | | | | | | | | | |

## 12369000 FLATHEAD RIVER NEAR BIGFORK, MONT.

LOCATION.--Lat 48°05'33", long 114°06'50", in NE¼NE¼ sec.22, T.27 N., R.20 W., Flathead County, at bridge on State Highway 208, 3 miles northwest of Bigfork, and at mile 106.5.

DRAINAGE AREA.--6,300 sq mi, approximately.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 14... | 1400 | 11300 | -- | .4 | 5.3 | .2 | .2 | 93 | .13 | 2840 | 100 | 2 |
| NOV. 18... | 1345 | 1950 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. 10... | 1200 | 11700 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. 21... | 1400 | 3000 | 25 | .3 | 3.8 | .8 | .1 | 88 | .12 | 713 | 89 | 1 |
| FEB. 17... | 1330 | 4700 | -- | -- | -- | .4 | .1 | -- | -- | -- | -- | -- |
| MAR. 15... | 1330 | 2300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. 12... | 1330 | 19000 | 26 | .6 | 3.0 | .7 | .2 | 114 | .16 | 5850 | 90 | 5 |
| MAY 17... | 1230 | 28500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE 07... | 1230 | 36900 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. 14... | 1400 | 11300 | 100 | 0 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0 |
| JAN. 21... | 1400 | 3000 | 100 | 0 | 200 | 0 | 10 | 0 | 0 | 0 | 1 | 80 |
| APR. 12... | 1330 | 19000 | 300 | 0 | 100 | 0 | 10 | 1 | 0 | 3 | 0 | 30 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. 14... | 1400 | 11300 | <10 | 50 | 5 | 10 | -- | 100 | 20 |
| JAN. 21... | 1400 | 3000 | <10 | <10 | <1 | 10 | .2 | 20 | 190 |
| APR. 12... | 1330 | 19000 | <10 | 90 | <1 | 20 | .1 | 40 | 10 |

12369000 FLATHEAD RIVER NEAR BIGFORK, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

REMARKS.--Water discharge estimated from records for station 12363000, Flathead River at Columbia Falls.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 14... | 2 | .00 | .000 | -- | .06 | .12 | .010 | .00 | .030 | 4.0 | .7 |
| NOV. | | | | | | | | | | | |
| 18... | -- | .1 | .000 | -- | .00 | .08 | .020 | .07 | .020 | 5.0 | .7 |
| DEC. | | | | | | | | | | | |
| 10... | -- | .1 | .010 | -- | .08 | .14 | .020 | .02 | .040 | 2.0 | .6 |
| JAN. | | | | | | | | | | | |
| 21... | 0 | -- | .020 | .00 | .02 | .02 | .020 | .04 | -- | 1.0 | .8 |
| FEB. | | | | | | | | | | | |
| 17... | -- | -- | .000 | .20 | .00 | .03 | .060 | .05 | .10 | .0 | .5 |
| MAR. | | | | | | | | | | | |
| 15... | -- | -- | .000 | .10 | .39 | .00 | .050 | .04 | .080 | 5.0 | .2 |
| APR. | | | | | | | | | | | |
| 12... | 5 | .1 | .000 | .10 | .26 | .20 | .010 | .00 | .030 | 1.0 | .8 |
| MAY | | | | | | | | | | | |
| 17... | -- | .1 | .000 | .10 | .04 | .18 | .040 | .09 | .10 | 6.0 | .6 |
| JUNE | | | | | | | | | | | |
| 07... | -- | .2 | .000 | .15 | .09 | .15 | .060 | .18 | .070 | 20 | .8 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 14... | 0 | -- | 0 | .0 | 1 | 0 | 0 | 0 | 100 | .0 | 20 |
| JAN. | | | | | | | | | | | |
| 21... | 1 | 6.4 | 0 | -- | 0 | 0 | 0 | 0 | 70 | .0 | 30 |
| APR. | | | | | | | | | | | |
| 12... | 0 | 6.2 | 20 | .1 | 0 | 0 | 5 | 1 | 120 | .0 | 10 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 14... | 1400 | 6.5 | 6.0 | 180 | 10.9 | 7.2 | 81 | 8 | 0 |
| NOV. | | | | | | | | | |
| 18... | 1345 | 5.0 | 2.0 | 205 | 11.7 | 7.7 | 99 | 10 | 0 |
| DEC. | | | | | | | | | |
| 10... | 1200 | 2.0 | .0 | 185 | 11.7 | 7.3 | 85 | 8 | 0 |
| JAN. | | | | | | | | | |
| 21... | 1400 | 2.5 | .0 | 180 | 11.7 | 7.2 | 83 | 28 | 8 |
| FEB. | | | | | | | | | |
| 17... | 1330 | 4.0 | 1.0 | 205 | 11.7 | 7.7 | 96 | 68 | 1 |
| MAR. | | | | | | | | | |
| 15... | 1330 | 4.0 | 3.5 | 205 | 11.3 | 8.1 | 103 | 2 | 0 |
| APR. | | | | | | | | | |
| 12... | 1330 | 4.5 | 9.0 | 200 | 12.8 | 8.2 | 83 | 17 | 0 |
| MAY | | | | | | | | | |
| 17... | 1230 | 6.0 | 4.5 | 155 | 11.8 | 7.6 | 74 | 49 | 24 |
| JUNE | | | | | | | | | |
| 07... | 1230 | 8.0 | 20.0 | 155 | 11.4 | 7.4 | 65 | 320 | 18 |

## 12371550 FLATHEAD LAKE AT POLSON, MONT.

LOCATION.--Lat 47°41'43", long 114°10'00", near center of sec.4, T.22 N., R.20 W., Lake County, at bridge on U.S. Highway 93 at western edge of Polson, 4.5 miles upstream from Kerr Dam and at mile 76.5.

DRAINAGE AREA.--7,086 sq mi.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 14... | 0945 | 10200 | -- | .4 | 3.3 | .3 | .1 | 88 | .12 | 2420 | 87 | 2 |
| NOV. | | | | | | | | | | | | |
| 18... | 1000 | 5860 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 10... | 0900 | 12000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 21... | 0900 | 9540 | 25 | .3 | 6.5 | .8 | .1 | 91 | .12 | 2340 | 86 | 1 |
| FEB. | | | | | | | | | | | | |
| 17... | 0900 | 14200 | -- | -- | -- | .2 | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 15... | 0930 | 8850 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 12... | 0900 | 11600 | 27 | .6 | [illegible] | .0 | .2 | 98 | .13 | 3070 | 93 | 1 |
| MAY | | | | | | | | | | | | |
| 17... | 0830 | 37000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 07... | 0830 | 42000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 14... | 0945 | 10200 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| JAN. | | | | | | | | | | | | |
| 21... | 0900 | 9540 | 100 | 20 | 0 | 0 | 10 | 0 | 0 | 0 | 1 | 60 |
| APR. | | | | | | | | | | | | |
| 12... | 0900 | 11600 | 300 | 30 | 400 | 0 | 0 | 1 | 0 | 1 | 0 | 10 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 14... | 0945 | 10200 | <10 | 20 | 1 | <10 | -- | 100 | 20 |
| JAN. | | | | | | | | | |
| 21... | 0900 | 9540 | <10 | <10 | <1 | <10 | .1 | 20 | 170 |
| APR. | | | | | | | | | |
| 12... | 0900 | 11600 | <10 | 10 | <1 | <10 | .1 | 50 | 10 |

12371550 FLATHEAD LAKE AT POLSON, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1971 (discontinued).

REMARKS.--Water discharges are given for station 12372000, Flathead River near Polson.

CHEMICAL ANALYSES, OCTOBER 1970 TO JUNE 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 14... | 1 | .00 | .010 | -- | .05 | .13 | .020 | .04 | .030 | 14 | .5 |
| NOV. | | | | | | | | | | | |
| 18... | -- | .00 | .000 | -- | .00 | .13 | .040 | .11 | .040 | 19 | .8 |
| DEC. | | | | | | | | | | | |
| 10... | -- | .00 | .010 | -- | .02 | .16 | .020 | .03 | .020 | 33 | .6 |
| JAN. | | | | | | | | | | | |
| 21... | 0 | -- | .040 | .00 | .00 | .03 | .19 | .59 | -- | 5.0 | .9 |
| FEB. | | | | | | | | | | | |
| 17... | -- | -- | .000 | .20 | .00 | .07 | .040 | .00 | .030 | 5.0 | .5 |
| MAR. | | | | | | | | | | | |
| 15... | -- | -- | .000 | .00 | .34 | .10 | .080 | .03 | -- | 2.0 | .3 |
| APR. | | | | | | | | | | | |
| 12... | 5 | .1 | .000 | .10 | .23 | .20 | .010 | .00 | .040 | .0 | 1.6 |
| MAY | | | | | | | | | | | |
| 17... | -- | .00 | .000 | .00 | .06 | .35 | .040 | .09 | .050 | 3.0 | .8 |
| JUNE | | | | | | | | | | | |
| 07... | -- | .00 | .000 | .01 | .10 | .12 | .010 | .03 | .080 | 69 | .6 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 14... | 0 | -- | 0 | 1.9 | 0 | 0 | 0 | 0 | 110 | .0 | 0 |
| JAN. | | | | | | | | | | | |
| 21... | 0 | 5.8 | 0 | -- | 0 | 0 | 0 | 0 | 80 | .0 | 10 |
| APR. | | | | | | | | | | | |
| 12... | 6 | 6.3 | 0 | .1 | 0 | 0 | 0 | 1 | 130 | .0 | 40 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 14... | 0945 | 8.0 | .0 | 175 | 10.0 | 7.5 | 84 | 2 | 0 |
| NOV. | | | | | | | | | |
| 18... | 1000 | 5.5 | .0 | 185 | 11.1 | 7.6 | 93 | 4 | 0 |
| DEC. | | | | | | | | | |
| 10... | 0900 | 2.0 | -5.5 | 195 | 11.7 | 7.3 | 88 | 0 | 0 |
| JAN. | | | | | | | | | |
| 21... | 0900 | 1.5 | .0 | 195 | 12.3 | 7.3 | 84 | 8 | 4 |
| FEB. | | | | | | | | | |
| 17... | 0900 | 3.5 | -2.0 | 180 | 12.1 | 7.5 | 84 | 0 | 0 |
| MAR. | | | | | | | | | |
| 15... | 0930 | 3.0 | 1.0 | 190 | 11.9 | 8.1 | 87 | 4 | 2 |
| APR. | | | | | | | | | |
| 12... | 0900 | 5.0 | 3.0 | 185 | 12.2 | 8.1 | 88 | 0 | 0 |
| MAY | | | | | | | | | |
| 17... | 0830 | 7.5 | 4.0 | 185 | 11.8 | 8.0 | 85 | 0 | 0 |
| JUNE | | | | | | | | | |
| 07... | 0830 | 10.5 | 10.5 | 180 | 11.2 | 7.7 | 77 | 12 | 0 |

## 12388700 FLATHEAD RIVER AT PERMA, MONT.

LOCATION.--Lat 47°22'01", long 114°35'03", in NW¼SW¼NW¼ sec.31, T.19 N., R.23 W., Sanders County, on upstream side of bridge on State Highway 382, at Perma, and at mile 10.9.

DRAINAGE AREA.--8,795 sq mi.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DISSOLVED CALCIUM (CA) (MG/L) | POTASSIUM (K) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | HARDNESS (CA,MG) (MG/L) | TURBIDITY (JTU) | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| JULY 27... | 1230 | 14000 | 25 | .3 | .1 | 88 | 10 | 7 | .00 |
| AUG. 17... | 1200 | 6440 | -- | -- | .1 | -- | 1 | 6 | -- |
| SEP. 14... | 1200 | 8720 | -- | -- | .1 | -- | 1 | 5 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DISSOLVED ARSENIC (AS) (UG/L) | DISSOLVED CADMIUM (CD) (UG/L) | DISSOLVED CHROMIUM (CR) (UG/L) | DISSOLVED COPPER (CU) (UG/L) | DISSOLVED IRON (FE) (UG/L) | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JULY 27... | 1230 | 14000 | 0 | 0 | 0 | 1 | 10 | 0 | 6.2 | .0 | 0 | 10 |
| AUG. 17... | 1200 | 6440 | -- | -- | -- | -- | 20 | -- | -- | .4 | -- | 0 |
| SEP. 14... | 1200 | 8720 | -- | -- | -- | -- | 10 | -- | -- | .2 | -- | 0 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CADMIUM (CD) (UG/L) | TOTAL CHROMIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| JULY 27... | 1230 | 14000 | 0 | <1 | 0 | <10 | <10 | 6 | .0 | 10 |

## 12389000 CLARK FORK NEAR PLAINS, MONT.

LOCATION.--Lat 47°25'47", long 114°51'18", E½SW¼ sec.1, T.19 N., R.26 W., Sanders County, temperature recorder at gaging station 2.4 miles southeast of Plains, 6.0 miles downstream from Flathead River, and at mile 239.0.

DRAINAGE AREA.--19,958 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to June 1970 (discontinued).
Water temperatures: November 1968 to September 1971.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | OCTOBER | | NOVEMBER | | DECEMBER | | JANUARY | | FEBRUARY | | MARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 11.5 | 11.5 | 5.5 | 5.5 | 2.0 | 2.0 | 1.0 | 0.5 | 3.5 | 3.5 | 2.0 | 2.0 |
| 2 | 11.5 | 11.5 | 5.5 | 5.0 | 2.0 | 2.0 | 0.5 | 0.5 | 3.5 | 3.5 | 2.0 | 2.0 |
| 3 | 11.5 | 11.5 | 5.0 | 5.0 | 2.0 | 1.5 | 0.5 | 0.5 | 3.5 | 3.0 | 2.0 | 2.0 |
| 4 | 11.5 | 11.5 | 5.0 | 4.5 | 1.5 | 1.0 | 0.5 | 0.5 | 3.0 | 2.5 | 2.0 | 2.0 |
| 5 | 11.5 | 11.5 | 5.0 | 4.5 | 1.0 | 1.0 | 0.5 | 0.5 | 2.5 | 2.5 | 2.0 | 2.0 |
| 6 | 11.5 | 10.5 | 5.5 | 5.0 | 1.0 | 1.0 | 0.5 | 0.5 | 2.5 | 2.0 | 2.0 | 1.5 |
| 7 | 10.5 | 10.0 | 5.5 | 5.5 | 1.5 | 1.0 | 0.5 | 0.5 | 2.0 | 2.0 | 2.0 | 1.5 |
| 8 | 10.0 | 9.5 | 5.5 | 5.5 | 2.0 | 1.5 | 0.5 | 0.0 | 2.0 | 1.5 | 2.0 | 2.0 |
| 9 | 9.5 | 9.5 | 5.5 | 5.5 | 2.0 | 1.0 | 0.0 | 0.0 | 1.5 | 1.5 | 3.0 | 2.0 |
| 10 | 10.0 | 9.5 | 6.0 | 5.5 | 1.5 | 1.0 | 0.0 | 0.0 | 1.5 | 1.5 | 3.0 | 2.5 |
| 11 | 9.5 | 9.5 | 6.0 | 6.0 | 1.5 | 1.5 | 0.0 | 0.0 | 2.0 | 1.5 | 3.0 | 3.0 |
| 12 | 9.5 | 9.5 | 6.0 | 5.5 | 2.0 | 1.5 | 1.0 | 0.0 | 2.0 | 2.0 | 3.5 | 3.0 |
| 13 | 9.5 | 9.5 | 5.5 | 5.5 | 2.0 | 1.0 | 0.5 | 0.5 | 2.0 | 2.0 | 4.0 | 3.5 |
| 14 | 9.5 | 9.0 | 5.5 | 5.0 | 1.0 | 1.0 | 0.5 | 0.5 | 2.5 | 2.0 | 4.0 | 3.5 |
| 15 | 9.0 | 8.5 | 5.0 | 4.5 | 1.0 | 1.0 | 0.5 | 0.0 | 2.5 | 2.5 | 4.0 | 3.5 |
| 16 | 9.0 | 8.5 | 4.5 | 4.5 | 1.5 | 1.0 | 0.0 | 0.0 | 3.0 | 2.5 | 4.0 | 3.5 |
| 17 | 8.5 | 8.5 | 5.0 | 4.5 | 2.0 | 1.5 | 0.0 | 0.0 | 3.0 | 3.0 | 4.0 | 3.5 |
| 18 | 8.5 | 8.0 | 5.0 | 5.0 | 2.0 | 2.0 | 0.0 | 0.0 | 3.0 | 2.5 | 4.0 | 3.5 |
| 19 | 8.5 | 8.0 | 5.0 | 4.5 | 2.0 | 1.5 | 0.5 | 0.0 | 2.5 | 2.5 | 4.0 | 3.5 |
| 20 | 9.0 | 8.5 | 4.5 | 4.0 | 1.5 | 1.5 | 0.5 | 0.5 | 2.5 | 2.5 | 4.0 | 4.0 |
| 21 | 9.0 | 9.0 | 4.0 | 3.0 | 1.5 | 1.5 | 0.5 | 0.5 | 2.5 | 2.5 | 4.0 | 4.0 |
| 22 | 9.0 | 9.0 | 3.0 | 2.0 | 1.5 | 1.0 | 0.5 | 0.0 | 2.5 | 2.5 | 4.0 | 4.0 |
| 23 | 9.0 | 8.5 | 2.0 | 1.5 | 1.0 | 0.5 | 0.5 | 0.0 | 2.5 | 2.5 | 4.0 | 4.0 |
| 24 | 8.5 | 8.5 | 2.0 | 1.5 | 0.5 | 0.5 | 1.0 | 0.5 | 2.5 | 2.5 | 4.0 | 4.0 |
| 25 | 8.5 | 8.0 | 2.5 | 2.0 | 0.5 | 0.5 | 1.0 | 1.0 | 2.5 | 2.5 | 4.0 | 4.0 |
| 26 | 8.0 | 7.0 | 2.5 | 2.5 | 0.5 | 0.5 | 1.0 | 1.0 | 2.5 | 2.0 | 4.0 | 4.0 |
| 27 | 7.0 | 7.0 | 2.0 | 2.0 | 0.5 | 0.5 | 1.0 | 1.0 | 2.0 | 2.0 | 4.5 | 4.0 |
| 28 | 7.0 | 7.0 | 2.0 | 1.5 | 0.5 | 0.5 | 1.5 | 1.0 | 2.0 | 2.0 | 4.5 | 4.5 |
| 29 | 7.0 | 6.5 | 1.5 | 1.5 | 1.0 | 0.5 | 1.5 | 1.5 | --- | --- | 4.5 | 4.5 |
| 30 | 6.5 | 6.0 | 2.0 | 1.5 | 1.0 | 1.0 | 2.5 | 1.5 | --- | --- | 5.0 | 4.5 |
| 31 | 6.0 | 5.5 | --- | --- | 1.0 | 1.0 | 3.5 | 2.5 | --- | --- | 5.0 | 5.0 |
| MONTH | 11.5 | 5.5 | 6.0 | 1.5 | 2.0 | 0.5 | 3.5 | 0.0 | 3.5 | 1.5 | 5.0 | 1.5 |

12388700 FLATHEAD RIVER AT PERMA, MONT.--Continued

PERIOD OF RECORD.--Chemical analyses: July to September 1971.

REMARKS.--Water discharge computed by subtracting the discharge of Clark Fork at St. Regis from that of Clark Fork near Plains.

CHEMICAL ANALYSES, JULY TO SEPTEMBER 1971

| DATE | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| JULY 27... | .000 | .00 | .06 | .020 | .00 | .030 | 5.0 | .4 |
| AUG. 17... | -- | -- | -- | -- | -- | -- | -- | 1.0 |
| SEP. 14... | -- | -- | -- | -- | -- | -- | -- | .8 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| JULY 27... | 1230 | 21.5 | 30.0 | 180 | 9.0 | 8.3 | 81 | 34 | 4 |
| AUG. 17... | 1200 | 21.0 | 23.5 | 205 | 8.4 | 8.2 | 86 | 24 | 9 |
| SEP. 14... | 1200 | 15.5 | 16.5 | 195 | 9.6 | 7.8 | 89 | 58 | 8 |

12389000 CLARK FORK NEAR PLAINS, MONT.--Continued

EXTREMES.--1970-71:
Water temperatures: Maximum, 23.0°C Aug. 9, 10; minimum, freezing point on several days during January.

Period of record:
Water temperatures: Maximum, 23.0°C Aug. 9, 10, 1971; minimum, freezing point on many days during winter periods most years.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| | APRIL | | MAY | | JUNE | | JULY | | AUGUST | | SEPTEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 5.0 | 5.0 | 6.5 | 6.5 | 10.0 | 10.0 | 13.5 | 13.0 | 20.5 | 20.5 | 20.5 | 18.5 |
| 2 | 5.0 | 5.0 | 7.0 | 6.5 | 10.0 | 10.0 | 14.0 | 13.5 | 21.0 | 20.5 | 18.5 | 17.5 |
| 3 | 5.0 | 5.0 | 7.5 | 7.0 | 10.0 | 10.0 | 14.0 | 14.0 | 21.0 | 21.0 | 17.5 | 17.5 |
| 4 | 5.0 | 5.0 | 8.0 | 7.5 | 10.5 | 10.0 | 14.0 | 14.0 | 21.5 | 21.0 | 17.5 | 17.0 |
| 5 | 5.5 | 5.0 | 8.0 | 8.0 | 10.5 | 10.5 | 14.5 | 14.0 | 22.5 | 21.5 | 18.0 | 17.0 |
| 6 | 6.0 | 5.5 | 8.0 | 7.5 | 10.5 | 10.5 | 14.5 | 14.5 | 22.0 | 22.0 | 18.5 | 18.0 |
| 7 | 6.5 | 6.0 | 7.5 | 7.0 | 10.5 | 10.0 | 14.5 | 14.0 | 22.0 | 22.0 | 18.0 | 17.5 |
| 8 | 6.5 | 6.5 | 7.5 | 7.0 | 10.0 | 10.0 | 14.5 | 14.0 | 22.5 | 22.0 | 18.0 | 17.5 |
| 9 | 6.5 | 6.5 | 7.5 | 7.5 | 10.0 | 10.0 | 15.0 | 14.5 | 23.0 | 22.5 | 18.0 | 17.5 |
| 10 | 6.5 | 6.5 | 8.0 | 7.5 | 10.0 | 10.0 | 15.5 | 15.0 | 23.0 | 22.5 | 17.5 | 17.0 |
| 11 | 6.5 | 6.0 | 8.0 | 7.5 | 10.0 | 10.0 | 15.5 | 15.5 | 22.5 | 22.5 | 18.0 | 17.5 |
| 12 | 6.0 | 5.5 | 8.0 | 8.0 | 10.5 | 10.0 | 15.5 | 15.0 | 22.5 | 22.5 | 18.0 | 17.0 |
| 13 | 6.0 | 5.5 | 8.5 | 8.0 | 11.0 | 10.5 | 16.0 | 15.5 | 22.5 | 22.5 | 17.5 | 16.5 |
| 14 | 6.0 | 5.5 | 8.5 | 8.5 | 11.0 | 11.0 | 16.0 | 16.0 | 22.5 | 22.5 | 16.5 | 16.0 |
| 15 | 6.0 | 6.0 | 8.5 | 8.0 | 11.0 | 11.0 | 16.5 | 16.0 | 22.5 | 22.0 | 16.0 | 15.5 |
| 16 | 6.5 | 6.0 | 8.0 | 8.0 | 11.5 | 11.0 | 17.5 | 16.5 | 22.5 | 22.0 | 16.0 | 15.5 |
| 17 | 6.5 | 6.0 | 8.0 | 8.0 | 11.0 | 11.0 | 18.0 | 17.5 | 22.0 | 21.5 | 15.5 | 15.0 |
| 18 | 6.0 | 5.5 | 8.0 | 8.0 | 11.5 | 11.0 | 18.5 | 18.0 | 22.0 | 21.5 | 15.0 | 14.5 |
| 19 | 6.0 | 5.5 | 8.0 | 7.5 | 11.5 | 11.5 | 19.0 | 18.5 | 21.5 | 21.5 | 15.0 | 14.5 |
| 20 | 6.5 | 6.0 | 7.5 | 7.5 | 12.5 | 11.5 | 19.0 | 19.0 | 21.5 | 21.5 | 14.5 | 14.0 |
| 21 | 6.5 | 6.5 | 7.5 | 7.0 | 13.0 | 12.5 | 19.0 | 19.0 | 21.5 | 21.5 | 14.0 | 13.5 |
| 22 | 6.5 | 6.5 | 7.0 | 7.0 | 14.0 | 13.0 | 19.5 | 19.0 | 22.0 | 21.5 | 14.0 | 13.5 |
| 23 | 7.0 | 6.5 | 7.5 | 7.0 | 14.5 | 14.0 | 20.0 | 19.5 | 21.5 | 20.5 | 14.5 | 14.0 |
| 24 | 7.0 | 7.0 | 8.0 | 7.5 | 14.5 | 14.5 | 20.0 | 20.0 | 20.5 | 20.0 | 14.5 | 14.0 |
| 25 | 7.0 | 6.5 | 8.5 | 8.0 | 15.0 | 14.5 | 20.5 | 20.0 | 20.5 | 20.5 | 14.5 | 13.5 |
| 26 | 7.0 | 7.0 | 9.0 | 8.5 | 15.0 | 14.5 | 20.5 | 20.5 | 21.0 | 20.5 | 13.5 | 13.5 |
| 27 | 7.0 | 7.0 | 9.5 | 9.0 | 14.5 | 14.0 | 20.5 | 20.5 | 21.0 | 21.0 | 13.5 | 13.5 |
| 28 | 7.0 | 6.5 | 9.5 | 9.5 | 14.0 | 13.5 | 20.5 | 20.5 | 21.5 | 21.0 | 13.5 | 13.0 |
| 29 | 6.5 | 6.5 | 10.0 | 9.5 | 13.5 | 12.5 | 20.5 | 20.0 | 21.5 | 21.5 | 13.0 | 12.5 |
| 30 | 6.5 | 6.5 | 10.0 | 10.0 | 13.0 | 12.5 | 20.5 | 20.0 | 21.5 | 21.5 | 13.0 | 12.0 |
| 31 | --- | --- | 10.0 | 10.0 | --- | --- | 20.5 | 20.5 | 21.5 | 20.5 | --- | --- |
| MONTH | 7.0 | 5.0 | 10.0 | 6.5 | 15.0 | 10.0 | 20.5 | 13.0 | 23.0 | 20.0 | 20.5 | 12.0 |
| YEAR | 23.0 | 0.0 | | | | | | | | | | |

12391000 CLARK FORK AT THOMPSON FALLS, MONT.

LOCATION.--Lat 47°36'17", long 115°22'30", in NE¼SE¼ sec.1, T.21 N., R.30 W., Sanders County, at bridge on U.S. Highway 10A, 1 mile west of Thompson Falls, 1.3 miles downstream from former gaging station, 6.5 miles downstream from Thompson River, and at mile 206.

CHEMICAL ANALYSES. WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | TUR-BID-ITY (JTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 13... | 0900 | 12600 | -- | 1.1 | 19 | 1.3 | .3 | 136 | .18 | 4630 | 110 | 3 |
| NOV. | | | | | | | | | | | | |
| 17... | 1030 | 9000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | | | | | | | | | | | | |
| 09... | 0800 | 12600 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JAN. | | | | | | | | | | | | |
| 20... | 0900 | 17500 | 29 | 1.7 | 22 | 1.6 | .2 | 125 | .17 | 5910 | 97 | 30 |
| FEB. | | | | | | | | | | | | |
| 16... | 0900 | 24000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MAR. | | | | | | | | | | | | |
| 16... | 0900 | 14600 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| APR. | | | | | | | | | | | | |
| 13... | 0900 | 20500 | 27 | 1.0 | 39 | .4 | .5 | 102 | .14 | 5650 | 94 | 10 |
| MAY | | | | | | | | | | | | |
| 18... | 0730 | 83000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | | | | | | | | | | | | |
| 08... | 0800 | 83300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | | | | | | | | | | | | |
| 27... | 0900 | 21400 | 26 | .5 | -- | -- | .1 | -- | -- | -- | 90 | 4 |
| AUG. | | | | | | | | | | | | |
| 17... | 0830 | 10400 | -- | -- | -- | -- | .2 | -- | -- | -- | -- | 1 |
| SEP. | | | | | | | | | | | | |
| 14... | 0900 | 11400 | -- | -- | -- | -- | .1 | -- | -- | -- | -- | 1 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | DIS-SOLVED IRON (FE) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 13... | 0900 | 12600 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NOV. | | | | | | | | | | | | |
| 17... | 1030 | 9000 | -- | -- | -- | -- | 20 | -- | -- | -- | 0 | 0 |
| DEC. | | | | | | | | | | | | |
| 09... | 0800 | 12600 | -- | -- | -- | -- | 0 | -- | -- | -- | 0 | 0 |
| JAN. | | | | | | | | | | | | |
| 20... | 0900 | 17500 | 300 | 0 | 100 | 0 | 20 | 0 | 0 | 3 | 4 | 200 |
| FEB. | | | | | | | | | | | | |
| 16... | 0900 | 24000 | -- | -- | -- | -- | 0 | -- | -- | -- | 12 | 120 |
| MAR. | | | | | | | | | | | | |
| 16... | 0900 | 14600 | -- | -- | -- | -- | 0 | -- | -- | -- | 12 | 120 |
| APR. | | | | | | | | | | | | |
| 13... | 0900 | 20500 | 400 | 30 | 100 | 2 | 10 | 0 | 0 | 1 | 3 | 20 |
| MAY | | | | | | | | | | | | |
| 18... | 0730 | 83000 | -- | -- | -- | -- | 0 | -- | -- | -- | 1 | 30 |
| JUNE | | | | | | | | | | | | |
| 08... | 0800 | 83300 | -- | -- | -- | -- | 30 | -- | -- | -- | 1 | 40 |
| JULY | | | | | | | | | | | | |
| 27... | 0900 | 21400 | -- | 0 | -- | -- | -- | 0 | 0 | -- | 2 | 10 |
| AUG. | | | | | | | | | | | | |
| 17... | 0830 | 10400 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 |
| SEP. | | | | | | | | | | | | |
| 14... | 0900 | 11400 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 |

| DATE | TIME | DIS-CHARGE (CFS) | TOTAL ARSENIC (AS) (UG/L) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL CHRO-MIUM (CR) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL STRON-TIUM (SR) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | | |
| 13... | 0900 | 12600 | -- | -- | -- | <10 | 40 | 5 | 20 | -- | 130 | <10 |
| NOV. | | | | | | | | | | | | |
| 17... | 1030 | 9000 | -- | -- | -- | -- | -- | -- | -- | .1 | -- | -- |
| DEC. | | | | | | | | | | | | |
| 09... | 0800 | 12600 | -- | -- | -- | <10 | 50 | <1 | 10 | -- | 70 | <10 |
| JAN. | | | | | | | | | | | | |
| 20... | 0900 | 17500 | -- | -- | -- | -- | -- | -- | -- | .2 | -- | -- |
| FEB. | | | | | | | | | | | | |
| 16... | 0900 | 24000 | -- | -- | -- | <10 | 100 | <1 | 10 | .1 | 60 | 20 |
| APR. | | | | | | | | | | | | |
| 13... | 0900 | 20500 | -- | -- | -- | 20 | 200 | 1 | 30 | .1 | 60 | 20 |
| MAY | | | | | | | | | | | | |
| 18... | 0730 | 83000 | -- | -- | -- | -- | -- | -- | -- | .1 | -- | -- |
| JUNE | | | | | | | | | | | | |
| 08... | 0800 | 83300 | -- | -- | -- | <10 | 210 | 2 | 30 | -- | 40 | <10 |
| JULY | | | | | | | | | | | | |
| 27... | 0900 | 21400 | 0 | <1 | 0 | <10 | 10 | 1 | -- | .0 | -- | <10 |

12391000 CLARK FORK AT THOMPSON FALLS, MONT.--Continued

DRAINAGE AREA.--21,113 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

REMARKS.--Discharge records furnished by the Montana Power Co.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | COLOR (PLATINUM-COBALT UNITS) | NITRATE (N) (MG/L) | NITRITE (N) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | ORGANIC NITROGEN (N) (MG/L) | DISSOLVED PHOSPHORUS (P) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | TOTAL ORGANIC CARBON (C) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 13... | 4 | .00 | .000 | -- | .00 | .15 | .020 | .02 | .040 | 1.0 | .9 |
| NOV. | | | | | | | | | | | |
| 17... | -- | .00 | -- | -- | .07 | -- | -- | .01 | .030 | 4.0 | .9 |
| DEC. | | | | | | | | | | | |
| 09... | -- | .00 | -- | -- | .05 | -- | -- | .02 | .010 | 13 | 1.2 |
| JAN. | | | | | | | | | | | |
| 20... | 20 | -- | .020 | .00 | .00 | .09 | .010 | .02 | -- | 3.0 | 2.2 |
| FEB. | | | | | | | | | | | |
| 16... | -- | -- | -- | .20 | .14 | -- | .020 | .00 | .030 | 1.0 | 1.7 |
| MAR. | | | | | | | | | | | |
| 16... | -- | -- | -- | .10 | .31 | -- | .030 | .07 | .030 | 5.0 | .5 |
| APR. | | | | | | | | | | | |
| 13... | 5 | .1 | .000 | .10 | .34 | .40 | .020 | .03 | .040 | 8.0 | 2.0 |
| MAY | | | | | | | | | | | |
| 18... | -- | -- | -- | .00 | .02 | -- | -- | .12 | .10 | 2.0 | .9 |
| JUNE | | | | | | | | | | | |
| 08... | -- | -- | -- | .03 | .05 | -- | -- | .06 | .050 | 8.0 | 1.1 |
| JULY | | | | | | | | | | | |
| 27... | 7 | .4 | .000 | .48 | .11 | -- | .030 | .00 | .050 | 8.0 | 1.2 |
| AUG. | | | | | | | | | | | |
| 17... | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1 |
| SEP. | | | | | | | | | | | |
| 14... | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | .8 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MAGNESIUM (MG) (MG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED STRONTIUM (SR) (UG/L) | DISSOLVED VANADIUM (V) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | | | |
| 13... | 0 | -- | 12 | .6 | 0 | 0 | 0 | 0 | 160 | .0 | 0 |
| NOV. | | | | | | | | | | | |
| 17... | 0 | -- | -- | .1 | -- | -- | -- | -- | 130 | -- | 10 |
| DEC. | | | | | | | | | | | |
| 09... | 0 | -- | 0 | .0 | -- | -- | -- | -- | 160 | -- | 0 |
| JAN. | | | | | | | | | | | |
| 20... | 1 | 5.9 | 0 | -- | 0 | 4 | 13 | 0 | 110 | .0 | 30 |
| FEB. | | | | | | | | | | | |
| 16... | -- | -- | -- | .1 | -- | -- | -- | -- | 190 | -- | 24 |
| MAR. | | | | | | | | | | | |
| 16... | -- | -- | 19 | .3 | -- | -- | -- | -- | 210 | -- | 28 |
| APR. | | | | | | | | | | | |
| 13... | 0 | 6.5 | 20 | .1 | 0 | 2 | 0 | 0 | 170 | .0 | 20 |
| MAY | | | | | | | | | | | |
| 18... | 1 | -- | 10 | .1 | -- | -- | -- | -- | 0 | -- | 40 |
| JUNE | | | | | | | | | | | |
| 08... | 0 | -- | 0 | .3 | -- | -- | -- | -- | 70 | -- | 10 |
| JULY | | | | | | | | | | | |
| 27... | 0 | 6.2 | -- | .0 | -- | -- | 0 | -- | -- | -- | 20 |
| AUG. | | | | | | | | | | | |
| 17... | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | 10 |
| SEP. | | | | | | | | | | | |
| 14... | -- | -- | -- | .1 | -- | -- | -- | -- | -- | -- | 10 |

FIELD DETERMINATIONS

| DATE | TIME | TEMPERATURE (DEG C) | AIR TEMPERATURE (DEG C) | SPECIFIC CONDUCTANCE (MICROMHOS) | DISSOLVED OXYGEN (MG/L) | PH (UNITS) | ALKALINITY AS CACO3 (MG/L) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|
| OCT. | | | | | | | | | |
| 13... | 0900 | 9.0 | 3.0 | 245 | 10.1 | 7.5 | 99 | 16 | 2 |
| NOV. | | | | | | | | | |
| 17... | 1030 | 5.0 | 4.5 | 220 | 11.9 | 7.8 | 105 | 12 | 1 |
| DEC. | | | | | | | | | |
| 09... | 0800 | 2.0 | -5.0 | 260 | 12.5 | 7.6 | 103 | 11 | 1 |
| JAN. | | | | | | | | | |
| 20... | 0900 | .0 | .0 | 225 | 12.7 | 6.7 | 80 | 72 | 96 |
| FEB. | | | | | | | | | |
| 16... | 0900 | 4.0 | 3.0 | 215 | 12.3 | 7.5 | 81 | 50 | 6 |
| MAR. | | | | | | | | | |
| 16... | 0900 | 4.0 | .0 | 235 | 12.3 | 8.3 | 93 | 0 | 0 |
| APR. | | | | | | | | | |
| 13... | 0900 | 5.5 | 3.0 | 220 | 12.8 | 8.2 | 82 | 48 | 2 |
| MAY | | | | | | | | | |
| 18... | 0730 | 8.0 | 6.0 | 160 | 11.6 | 7.8 | 66 | 70 | 18 |
| JUNE | | | | | | | | | |
| 08... | 0800 | 11.0 | 9.5 | 165 | 11.2 | 7.5 | 68 | 360 | 16 |
| JULY | | | | | | | | | |
| 27... | 0900 | 21.0 | 19.0 | 195 | 9.0 | 8.0 | 80 | 30 | 8 |
| AUG. | | | | | | | | | |
| 17... | 0830 | 21.5 | 16.5 | 205 | 8.8 | 8.2 | 84 | 10 | 4 |
| SEP. | | | | | | | | | |
| 14... | 0900 | 14.5 | .5 | 225 | 10.0 | 8.3 | 93 | 16 | 1 |

MILK RIVER BASIN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06174500 - MILK RIVER AT NASHUA, MONT. (LAT 48 07 52 LONG 106 21 50) | | | | | | | | | | | | |
| MAY , 1971 | | | | | | | | | | | | |
| 21... | 1000 | 260 | 13.5 | 8.7 | 40 | 71 | 30 | 100 | 7.8 | 271 | -- | 290 |
| JUNE | | | | | | | | | | | | |
| 23... | 1330 | 307 | 24.0 | 6.4 | 20 | 55 | 26 | 93 | 6.4 | 280 | 0 | 210 |
| JULY | | | | | | | | | | | | |
| 22... | 1330 | 61 | 23.5 | 6.9 | 20 | 76 | 36 | 160 | 8.1 | 343 | 0 | 380 |
| AUG. | | | | | | | | | | | | |
| 24... | 1330 | 129 | 20.5 | 7.7 | 20 | 72 | 35 | 170 | 8.3 | 359 | 0 | 360 |
| SEP. | | | | | | | | | | | | |
| 22... | 1445 | 170 | 12.0 | 7.4 | 20 | 53 | 26 | 100 | 5.7 | 295 | 0 | 220 |

YELLOWSTONE RIVER BASIN

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRATE (N) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | | |
| OCT. | | | | | | | | | |
| 22... | 0830 | 1620 | 16 | 5.1 | 19 | 30 | 9.9 | .9 | -- |
| 23... | 1330 | 1570 | 15 | 5.0 | 20 | 29 | 10 | .9 | .4 |
| JAN. | | | | | | | | | |
| 26... | 0830 | 1130 | 16 | 5.4 | 13 | 38 | 13 | 1.0 | -- |
| APR. | | | | | | | | | |
| 27... | 1550 | 1510 | 20 | 6.4 | 15 | 32 | 12 | .7 | -- |
| JULY | | | | | | | | | |
| 26... | 1800 | 7990 | 9.2 | 3.0 | 10 | 60 | 5.4 | .5 | -- |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) | CYANIDE (CN) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | | |
| OCT. | | | | | | | | | |
| 22... | 0830 | 1620 | -- | -- | 370 | -- | -- | -- | -- |
| 23... | 1330 | 1570 | 20 | 0 | 350 | 0 | 0 | 0 | .00 |
| JAN. | | | | | | | | | |
| 26... | 0830 | 1130 | -- | 0 | 470 | 0 | -- | 0 | .00 |
| APR. | | | | | | | | | |
| 27... | 1550 | 1510 | 0 | 0 | 390 | 0 | 0 | 18 | .00 |
| JULY | | | | | | | | | |
| 26... | 1800 | 7990 | 5 | 0 | 170 | 0 | 0 | 1 | .00 |

MILK RIVER BASIN--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | CHLORIDE (CL) (MG/L) | DISSOLVED FLUORIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L) | DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | NONCARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06174500 - MILK RIVER AT NASHUA, MONT. (LAT 48 07 52 LONG 106 21 50) | | | | | | | | | | | | |
| MAY , 1971 | | | | | | | | | | | | |
| 21... | 22 | .3 | .00 | .12 | 663 | .90 | 465 | 300 | 78 | 2.5 | 1030 | 7.7 |
| JUNE | | | | | | | | | | | | |
| 23... | 14 | .3 | .03 | .09 | 549 | .75 | 455 | 240 | 15 | 2.6 | 870 | 8.0 |
| JULY | | | | | | | | | | | | |
| 22... | 32 | .4 | .02 | .09 | 869 | 1.18 | 143 | 340 | 57 | 3.8 | 1260 | 8.4 |
| AUG. | | | | | | | | | | | | |
| 24... | 31 | .4 | .02 | .06 | 861 | 1.17 | 300 | 320 | 29 | 4.1 | 1350 | 7.9 |
| SEP. | | | | | | | | | | | | |
| 22... | 17 | .3 | .07 | .03 | 575 | .78 | 264 | 240 | 0 | 2.8 | 885 | 8.1 |

YELLOWSTONE RIVER BASIN--Continued

| DATE | NITRITE PLUS NITRATE (N) (MG/L) | DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | DISSOLVED SOLIDS (TONS PER DAY) | HARDNESS (CA,MG) (MG/L) | AMMONIA NITROGEN (N) (MG/L) | TOTAL PHOSPHORUS (P) (MG/L) | BIOCHEMICAL OXYGEN DEMAND (MG/L) |
|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | |
| OCT. | | | | | | | | |
| 22... | -- | 154 | .21 | 674 | 61 | -- | -- | -- |
| 23... | -- | 149 | .20 | 632 | 58 | .03 | .060 | 1.0 |
| JAN. | | | | | | | | |
| 26... | .40 | 174 | .24 | 531 | 62 | .08 | -- | .7 |
| APR. | | | | | | | | |
| 27... | .10 | 190 | .26 | 775 | 76 | .11 | .060 | 1.1 |
| JULY | | | | | | | | |
| 26... | 1.9 | 84 | .11 | 1810 | 35 | .06 | .060 | 1.0 |

| DATE | DISSOLVED LEAD (PB) (UG/L) | DISSOLVED MANGANESE (MN) (UG/L) | DISSOLVED MERCURY (HG) (UG/L) | DISSOLVED MOLYBDENUM (MO) (UG/L) | DISSOLVED NICKEL (NI) (UG/L) | DISSOLVED SELENIUM (SE) (UG/L) | DISSOLVED SILVER (AG) (UG/L) | DISSOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | |
| OCT. | | | | | | | | |
| 22... | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 0 | 11 | .0 | 3 | 1 | 4 | 0 | 10 |
| JAN. | | | | | | | | |
| 26... | 0 | 0 | -- | 2 | 0 | -- | 1 | 10 |
| APR. | | | | | | | | |
| 27... | 0 | 20 | .1 | 0 | 23 | 0 | 0 | 20 |
| JULY | | | | | | | | |
| 26... | 0 | 760 | 1.8 | 3 | 1 | 4 | 0 | 0 |

YELLOWSTONE RIVER BASIN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | ALDRIN (UG/L) | LINDANE (UG/L) | CHLOR-DANE (UG/L) | DDD (UG/L) | DDE (UG/L) | DDT (UG/L) | DI-ELDRIN (UG/L) | ENDRIN (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | | | |
| OCT. | | | | | | | | | | |
| 23... | 1330 | 1570 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | | |
| 26... | 0830 | 1130 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | | |
| 27... | 1550 | 1510 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | | |
| 26... | 1800 | 7990 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

| DATE | HEPTA-CHLOR (UG/L) | HEPTA-CHLOR EPOXIDE (UG/L) | MALA-THION (UG/L) | PARA-THION (UG/L) | DI-AZINON (UG/L) | METHYL PARA-THION (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|---|---|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | | | |
| OCT. | | | | | | | | | |
| 23... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JAN., 1971 | | | | | | | | | |
| 26... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| APR. | | | | | | | | | |
| 27... | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| JULY | | | | | | | | | |
| 26... | .00 | .00 | -- | -- | -- | -- | .00 | .00 | .00 |

FIELD DETERMINATIONS

| DATE | TIME | TEMP-ERATURE (DEG C) | AIR TEMP-ERATURE (DEG C) | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | FECAL COLI-FORM (COL. PER 100 ML) |
|---|---|---|---|---|---|---|---|
| 06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT. (LAT 45 06 43 LONG 110 47 37) | | | | | | | |
| OCT. | | | | | | | |
| 23... | 1330 | 5.5 | 5.0 | 220 | 11.0 | 8.3 | 88 |
| JAN. | | | | | | | |
| 26... | 0830 | 3.0 | 4.0 | 260 | 11.4 | 7.7 | 39 |
| APR. | | | | | | | |
| 27... | 1550 | 7.0 | 9.0 | 255 | 12.2 | 8.4 | 7 |
| JULY | | | | | | | |
| 26... | 1800 | 16.0 | 27.0 | 130 | 8.6 | 7.5 | 24 |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | HEXA-VALENT CHRO-MIUM (CR6) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | TOTAL MERCURY (HG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| **SASKATCHEWAN RIVER BASIN** | | | | | | | | | | |
| **05014500 - SWIFTCURRENT CREEK AT MANY GLACIER, MONT. (LAT 48 48 06 LONG 113 39 18)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 02... | 1010 | 60 | 8.0 | 0 | 0 | 0 | 0 | 0 | .1 | 10 |
| **PRICKLY PEAR CREEK BASIN** | | | | | | | | | | |
| **06062010 - PRICKLY PEAR CREEK BELOW EAST HELENA, MONT. (LAT 45 35 54 LONG 111 55 48)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 09... | 0900 | -- | 4.5 | 5 | 2 | -- | 0 | 23 | .0 | 130 |
| **MISSOURI RIVER BASIN** | | | | | | | | | | |
| **06090130 - MISSOURI R BLW RAINBOW DAM NR GREAT FALLS, MONT. (LAT 47 32 10 LONG 111 11 45)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 13... | 1400 | 6000 | -- | 8 | 0 | -- | 0 | 0 | .0 | 18 |
| **YELLOWSTONE RIVER BASIN** | | | | | | | | | | |
| **06217500 - YELLOWSTONE R. AT HUNTLY, MONT. (LAT 46 54 15 LONG 108 19 01)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 08... | 1145 | 5100 | 7.0 | 7 | 0 | 0 | 0 | 0 | .1 | 27 |
| **PEND OREILLE RIVER BASIN** | | | | | | | | | | |
| **12323750 - SILVER BOW C AB WARM SPRNGS C AT WARM SPRNG MONT (LAT 46 11 07 LONG 112 46 04)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 07... | 1630 | 150 | 5.0 | 2 | 2 | -- | 0 | 0 | .0 | 440 |
| **12330100 - FLINT CREEK BLW BOULDER CREEK NR MAXVILLE, MONT. (LAT 46 29 21 LONG 113 14 10)** | | | | | | | | | | |
| OCT., 1970 | | | | | | | | | | |
| 07... | 1315 | 150 | 3.0 | 2 | 0 | -- | 0 | 0 | .2 | 21 |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

MARIAS RIVER BASIN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED CAL-CIUM (CA) (MG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED SODIUM (NA) (MG/L) | DIS-SOLVED PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | DIS-SOLVED SULFATE (SO4) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06091850 - TWO MED CA WWY TO MSSN LK NR BLACKFOOT, MONT. (LAT 48 32 40 LONG 112 41 12) | | | | | | | | | | | | |
| MAY , 1971 | | | | | | | | | | | | |
| 21... | 1150 | 27 | 6.0 | 4.5 | 60 | 20 | 5.0 | 2.0 | .5 | 79 | -- | 12 |
| 25-31 | -- | 32 | -- | 4.0 | 40 | 16 | 4.2 | 1.9 | .3 | 68 | 0 | 8.8 |
| JUNE | | | | | | | | | | | | |
| 10... | 1030 | 17 | -- | 3.8 | 40 | 15 | 4.5 | 1.3 | .1 | 67 | 0 | 9.0 |
| 10-18 | -- | 23 | -- | 3.6 | 10 | 16 | 4.0 | 1.7 | .6 | 74 | 0 | 6.8 |
| 20-26 | -- | 11 | -- | 3.6 | 10 | 16 | 4.3 | 1.7 | .5 | 73 | 0 | 7.3 |
| 30... | 1625 | 2.2 | 14.0 | 3.5 | 10 | 15 | 4.8 | 1.4 | .2 | 73 | 0 | 8.8 |
| 30-30 | -- | 5.4 | -- | 3.7 | 10 | 16 | 4.5 | 1.5 | .3 | 74 | 0 | 8.0 |
| JULY | | | | | | | | | | | | |
| 01-07 | -- | 5.4 | -- | 3.7 | 10 | 16 | 4.5 | 1.5 | .3 | 74 | 0 | 8.0 |
| 07... | 1120 | 2.3 | 12.0 | 3.1 | 10 | 17 | 4.6 | 1.2 | .6 | 70 | 0 | 8.8 |
| 09-15 | -- | 2.2 | -- | 3.5 | 10 | 18 | 5.2 | 1.7 | .5 | 82 | 0 | 10 |
| 22... | 1200 | 2.2 | 20.0 | 3.0 | 10 | 16 | 4.6 | 1.5 | .5 | 72 | 0 | 8.5 |
| 25-31 | -- | 5.8 | -- | 3.6 | 10 | 20 | 5.5 | 2.0 | .6 | 89 | 0 | 11 |
| 28... | 1230 | 8.7 | 21.5 | 3.4 | 10 | 18 | 4.9 | 1.9 | .4 | 88 | 0 | 6.8 |
| AUG. | | | | | | | | | | | | |
| 02-12 | -- | 3.8 | -- | 3.3 | 10 | 18 | 5.5 | 1.8 | .5 | 82 | 0 | 11 |
| 07... | 0730 | 4.2 | 22.5 | 3.3 | 10 | 19 | 5.6 | 1.9 | .5 | 87 | 0 | 10 |
| 13... | 1000 | 34 | 18.5 | 3.0 | 20 | 18 | 5.5 | 1.8 | .6 | 82 | 0 | 10 |
| 27... | 1445 | 87 | 18.0 | 2.3 | 5 | 18 | 5.6 | 2.1 | .6 | 93 | 0 | 10 |
| SEP. | | | | | | | | | | | | |
| 08... | 1445 | 51 | 13.5 | 1.8 | 20 | 19 | 5.8 | 1.9 | .6 | 78 | 0 | 13 |
| 23... | 1515 | 49 | 11.0 | 1.9 | 20 | 21 | 5.9 | 2.4 | .4 | 91 | 0 | 15 |
| 06091852 - MISSION LAKE NR. BLACKFOOT, MONT. (LAT 48 33 48 LONG 112 37 49) | | | | | | | | | | | | |
| MAR., 1971 | | | | | | | | | | | | |
| 31... | 1100 | -- | 2.0 | 1.7 | 20 | 50 | 39 | 96 | 3.7 | 208 | 0 | 290 |
| APR. | | | | | | | | | | | | |
| 29... | 1510 | -- | 15.5 | .2 | 10 | 53 | 39 | 70 | 4.2 | 206 | 0 | 270 |
| MAY | | | | | | | | | | | | |
| 12... | 1400 | -- | 16.0 | .2 | 20 | 52 | 45 | 77 | 3.3 | 200 | 0 | 290 |
| AUG. | | | | | | | | | | | | |
| 12... | 1510 | -- | 23.0 | 2.6 | 20 | 40 | 36 | 71 | 2.7 | 129 | 24 | 250 |
| 27... | 1300 | -- | 20.0 | 2.8 | 5 | 40 | 36 | 72 | 2.9 | 183 | 0 | 240 |
| SEP. | | | | | | | | | | | | |
| 02... | 1240 | -- | 13.0 | 2.8 | 20 | 41 | 34 | 70 | 3.3 | 201 | 0 | 250 |
| 09... | 1100 | -- | 14.0 | 2.6 | 10 | 37 | 33 | 64 | 2.7 | 166 | 0 | 230 |
| 23... | 1630 | -- | 21.0 | 2.5 | 20 | 38 | 31 | 60 | 2.7 | 172 | 0 | 220 |
| 06091853 - SPRING C AT MISSION LK OUT NR CUTBANK, MONT. (LAT 48 33 27 LONG 112 36 00) | | | | | | | | | | | | |
| APR., 1971 | | | | | | | | | | | | |
| 03-12 | -- | 55 | -- | 1.4 | 40 | 46 | 35 | 83 | 3.5 | 173 | -- | 260 |
| 15... | 1330 | 32 | 5.0 | .6 | 30 | 48 | 37 | 59 | 3.4 | 193 | -- | 260 |
| MAY | | | | | | | | | | | | |
| 17-21 | -- | 6.9 | -- | .4 | 10 | 50 | 39 | 80 | 3.2 | 205 | 0 | 300 |
| 20... | 1145 | 14 | 8.0 | .6 | 100 | 48 | 37 | 77 | 3.3 | 195 | -- | 250 |
| 24-30 | -- | 25 | -- | 1.4 | 20 | 46 | 37 | 80 | 2.9 | 192 | 0 | 290 |
| JUNE | | | | | | | | | | | | |
| 09... | 1750 | 29 | -- | 1.2 | 20 | 44 | 37 | 72 | 2.9 | 191 | 0 | 250 |
| 13-19 | -- | 16 | -- | 1.6 | 10 | 39 | 33 | 66 | 2.9 | 171 | 0 | 230 |
| 21-27 | -- | 18 | -- | 1.5 | 10 | 36 | 32 | 69 | 3.0 | 163 | 0 | 240 |
| JULY | | | | | | | | | | | | |
| 02-14 | -- | 28 | -- | .9 | 10 | 29 | 33 | 71 | 2.5 | 139 | 0 | 250 |
| 08... | 1320 | 28 | 20.5 | .6 | 10 | 28 | 35 | 69 | 2.6 | 87 | 48 | 240 |
| 21... | 1700 | 14 | 23.0 | .6 | 20 | 28 | 35 | 71 | 2.8 | 45 | 85 | 220 |
| 24-31 | -- | 10 | -- | .6 | 10 | 30 | 35 | 71 | 2.4 | 146 | 0 | 250 |
| 31... | 1150 | 9.3 | 23.5 | .7 | 10 | 28 | 36 | 72 | 2.3 | 95 | 25 | 250 |
| AUG. | | | | | | | | | | | | |
| 02-08 | -- | 7.5 | -- | .7 | 10 | 28 | 36 | 75 | 2.6 | 144 | 0 | 250 |

YELLOWSTONE RIVER BASIN

06207530 - SILVER TIP C. AB GOBBLERS DRAW NR BELFRY MONT. (LAT 45 03 22 LONG 108 57 28)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JUNE, 1971 | | | | | | | | | | | |
| 11... | 1530 | 1.0 | 23.0 | 17 | 50 | 300 | 130 | 1300 | 54 | 368 | 0 | 3000 |

| DATE | TIME | DIS-CHARGE (CFS) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CHRO-MIUM (CR) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) |
|---|---|---|---|---|---|---|---|---|
| 06207530 - SILVER TIP C. AB GOBBLERS DRAW NR BELFRY MONT. (LAT 45 03 22 LONG 108 57 28) | | | | | | | | |
| JUNE, 1971 | | | | | | | | |
| 11... | 1530 | 1.0 | 4 | 0 | 2800 | 1 | 8 | 63 |

MARIAS RIVER BASIN--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06091850 - TWO MED CA WWY TO MSSN LK NR BLACKFOOT, MONT. (LAT 48 32 40 LONG 112 41 12) | | | | | | | | | | | | |
| MAY , 1971 | | | | | | | | | | | | |
| 21... | .2 | .1 | .00 | .06 | 83 | .11 | 6.05 | 70 | 6 | .1 | 139 | 7.8 |
| 25-31 | .7 | .0 | .04 | .00 | 70 | .10 | 6.05 | 57 | 1 | .1 | 115 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 10... | .2 | .0 | .00 | .00 | 67 | .09 | 3.08 | 56 | 1 | .1 | 117 | 8.0 |
| 10-18 | 1.3 | .3 | .03 | .00 | 71 | .10 | 4.41 | 56 | 0 | .1 | 121 | 7.3 |
| 20-26 | 1.4 | .3 | .02 | .00 | 71 | .10 | 2.11 | 58 | 0 | .1 | 120 | 7.8 |
| 30... | .0 | .3 | .03 | .03 | 70 | .10 | .42 | 57 | 0 | .1 | 126 | 7.8 |
| 30-30 | .4 | .1 | .06 | .06 | 71 | .10 | 1.04 | 58 | 0 | .1 | 123 | 7.4 |
| JULY | | | | | | | | | | | | |
| 01-07 | .4 | .1 | .06 | .06 | 71 | .10 | 1.04 | 58 | 0 | .1 | 123 | 7.4 |
| 07... | .6 | .1 | .00 | .00 | 70 | .10 | .43 | 61 | 4 | .1 | 121 | 8.2 |
| 09-15 | .1 | .2 | .02 | .03 | 80 | .11 | .48 | 66 | 0 | .1 | 143 | 7.4 |
| 22... | .7 | .3 | .00 | .00 | 71 | .10 | .42 | 59 | 0 | .1 | 122 | 8.1 |
| 25-31 | .2 | .2 | .02 | .03 | 87 | .12 | 1.36 | 73 | 0 | .1 | 156 | 7.4 |
| 28... | .2 | .4 | .01 | .03 | 79 | .11 | 1.86 | 65 | 0 | .1 | 144 | 7.5 |
| AUG. | | | | | | | | | | | | |
| 02-12 | .1 | .1 | .05 | .03 | 81 | .11 | .83 | 68 | 0 | .1 | 145 | 7.5 |
| 07... | .1 | .4 | .01 | .03 | 84 | .11 | .95 | 70 | 0 | .1 | 152 | 7.2 |
| 13... | .4 | .3 | .06 | .00 | 80 | .11 | 7.34 | 68 | 0 | .1 | 140 | 7.5 |
| 27... | .9 | .5 | .01 | .03 | 86 | .12 | 20.2 | 68 | 0 | .1 | 147 | 7.8 |
| SEP. | | | | | | | | | | | | |
| 08... | 1.1 | .6 | .00 | .00 | 82 | .11 | 11.3 | 71 | 7 | .1 | 148 | 8.0 |
| 23... | .3 | .0 | .00 | .00 | 92 | .22 | 21.7 | 77 | 2 | .1 | 160 | 7.8 |
| 06091852 - MISSION LAKE NR. BLACKFOOT, MONT. (LAT 48 33 48 LONG 112 37 49) | | | | | | | | | | | | |
| MAR., 1971 | | | | | | | | | | | | |
| 31... | 6.9 | .6 | .30 | .12 | 592 | .81 | -- | 290 | 110 | 2.5 | 842 | 8.4 |
| APR. | | | | | | | | | | | | |
| 29... | 7.0 | .6 | .00 | .06 | 545 | .74 | -- | 290 | 120 | 1.8 | 874 | 7.7 |
| MAY | | | | | | | | | | | | |
| 12... | 6.8 | .4 | .00 | .09 | 573 | .78 | -- | 310 | 150 | 1.9 | 878 | 7.9 |
| AUG. | | | | | | | | | | | | |
| 12... | 4.2 | .4 | .00 | .15 | 495 | .67 | -- | 250 | 100 | 2.0 | 774 | 8.4 |
| 27... | 6.4 | .7 | .03 | .15 | 491 | .67 | -- | 250 | 98 | 2.0 | 779 | 8.5 |
| SEP. | | | | | | | | | | | | |
| 02... | 5.4 | .7 | .27 | .12 | 507 | .69 | -- | 240 | 77 | 2.0 | 802 | 7.5 |
| 09... | 5.4 | .7 | .00 | .18 | 457 | .62 | -- | 230 | 92 | 1.8 | 724 | 8.3 |
| 23... | 3.0 | .1 | .03 | .15 | 442 | .66 | -- | 220 | 81 | 1.8 | 703 | 7.5 |
| 06091853 - SPRING C AT MISSION LK OUT NR CUTBANK MONT. (LAT 48 33 27 LONG 112 36 00) | | | | | | | | | | | | |
| APR., 1971 | | | | | | | | | | | | |
| 03-12 | 5.7 | .3 | .00 | .06 | 520 | -- | 77.2 | 260 | 120 | 2.2 | 830 | 8.1 |
| 15... | 5.3 | .5 | .10 | .03 | 509 | .69 | 44.0 | 270 | 110 | 1.6 | 788 | 8.1 |
| MAY | | | | | | | | | | | | |
| 17-21 | 5.4 | .3 | .01 | .03 | 579 | .79 | 10.8 | 290 | 120 | 2.1 | 879 | 7.8 |
| 20... | 6.8 | .2 | .00 | .09 | 519 | .71 | 19.6 | 270 | 110 | 2.0 | 854 | 8.0 |
| 24-30 | 4.9 | .2 | .01 | .09 | 557 | .76 | 37.6 | 270 | 110 | 2.1 | 818 | 7.8 |
| JUNE | | | | | | | | | | | | |
| 09... | 4.7 | .2 | .00 | .09 | 506 | .69 | 39.6 | 260 | 110 | 1.9 | 814 | 8.0 |
| 13-19 | 5.6 | .3 | .04 | .03 | 463 | .63 | 20.0 | 230 | 93 | 1.9 | 686 | 7.9 |
| 21-27 | 4.7 | .3 | .02 | .03 | 467 | .64 | 22.7 | 220 | 88 | 2.0 | 688 | 7.9 |
| JULY | | | | | | | | | | | | |
| 02-14 | 4.3 | .4 | .01 | .03 | 460 | .63 | 34.8 | 210 | 94 | 2.1 | 736 | 7.9 |
| 08... | 4.6 | .2 | .01 | .03 | 443 | .67 | 33.5 | 210 | 63 | 2.1 | 707 | 9.0 |
| 21... | 4.9 | .2 | .00 | .06 | 428 | .64 | 17.8 | 214 | 35 | 2.1 | 707 | 9.0 |
| 24-31 | 5.4 | .3 | .03 | .09 | 467 | .64 | 12.6 | 220 | 99 | 2.1 | 747 | 8.0 |
| 31... | 4.7 | .2 | .02 | .06 | 466 | .63 | 11.7 | 220 | 98 | 2.1 | 747 | 8.5 |
| AUG. | | | | | | | | | | | | |
| 02-08 | 4.6 | .2 | .06 | .12 | 468 | .64 | 9.48 | 220 | 100 | 2.2 | 748 | 8.0 |

YELLOWSTONE RIVER BASIN--Continued

06207530 - SILVER TIP C. AB GOBBLERS DRAW NR BELFRY MONT. (LAT 45 03 22 LONG 108 57 28)

| DATE | DIS-SOLVED CHLO-RIDE (CL) (MG/L) | DIS-SOLVED FLUO-RIDE (F) (MG/L) | NITRITE PLUS NITRATE (N) (MG/L) | DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | DIS-SOLVED SOLIDS (TONS PER DAY) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUNE, 1971 | | | | | | | | | | | | |
| 11... | 560 | 1.3 | .48 | .09 | 5550 | 7.55 | 15.0 | 1300 | 980 | 16 | 6980 | 7.7 |

| DATE | CYANIDE (CN) (MG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|
| 06207530 - SILVER TIP C. AB GOBBLERS DRAW NR BELFRY MONT. (LAT 45 03 22 LONG 108 57 28) | | | | | | | |
| JUNE, 1971 | | | | | | | |
| 11... | .00 | 6 | 810 | .3 | 3 | 42 | 10 |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

KOOTENAI RIVER BASIN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | DIS-SOLVED ALUM-INUM (AL) (UG/L) | DIS-SOLVED ARSENIC (AS) (UG/L) | DIS-SOLVED BARIUM (BA) (UG/L) | DIS-SOLVED BERYL-LIUM (BE) (UG/L) | DIS-SOLVED BORON (B) (UG/L) | DIS-SOLVED CAD-MIUM (CD) (UG/L) | DIS-SOLVED COBALT (CO) (UG/L) | DIS-SOLVED COPPER (CU) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12303400 - ROSS CREEK NEAR TROY, MONT. (LAT 48 12 25 LONG 115 52 09) | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | 1700 | 29 | 4.0 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 0 |
| MAY , 1971 | | | | | | | | | | | |
| 04... | 1300 | 498 | -- | 300 | -- | 0 | 0 | -- | 0 | -- | -- |
| PEND OREILLE RIVER BASIN | | | | | | | | | | | |
| 12391500 - BULL RIVER NEAR HERON, MONT. (LAT 48 10 54 LONG 115 51 39) | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | 1500 | 57 | 5.0 | 100 | 0 | 0 | 0 | 30 | 0 | 0 | 0 |
| MAY , 1971 | | | | | | | | | | | |
| 04... | 1100 | 686 | 4.5 | 400 | -- | 100 | 0 | -- | 0 | -- | -- |

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL COBALT (CO) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KOOTENAI RIVER BASIN | | | | | | | | | | | |
| 12303400 - ROSS CREEK NEAR TROY, MONT. (LAT 48 12 25 LONG 115 52 09) | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | 1700 | 29 | 4.0 | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1971 | | | | | | | | | | | |
| 04... | 1300 | 498 | -- | 1 | 2 | <10 | 60 | 1 | 10 | <.5 | <10 |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

YELLOWSTONE RIVER BASIN

INSTANTANEOUS SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

06202530 STILLWATER RIVER ABOVE WEST FORK AT NYE, MONT.

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 05... | 1500 | 12.0 | 178 | 2 | .96 |
| NOV. | | | | | |
| 12... | 1430 | 2.5 | 97 | 1 | .26 |
| DEC. | | | | | |
| 10... | 1610 | 1.0 | 83 | 3 | .67 |
| JAN. | | | | | |
| 12... | 1430 | .0 | 66 | 3 | .53 |
| FEB. | | | | | |
| 10... | 1550 | 2.5 | 83 | 3 | .67 |
| MAR. | | | | | |
| 10... | 1510 | 4.0 | 56 | 1 | .15 |
| APR. | | | | | |
| 12... | 1325 | 7.5 | 51 | 2 | .28 |
| MAY | | | | | |
| 11... | 1450 | 9.0 | 432 | 8 | 9.3 |
| JUNE | | | | | |
| 10... | 1300 | 7.0 | 2450 | 29 | 192 |
| JULY | | | | | |
| 08... | 1545 | 8.0 | 1610 | 9 | 39 |
| AUG. | | | | | |
| 16... | 1740 | 18.5 | 387 | 2 | 2.1 |
| SEP. | | | | | |
| 08... | 1315 | 10.5 | 394 | 1 | 1.1 |

KOOTENAI RIVER BASIN--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

| DATE | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12303400 - ROSS CREEK NEAR TROY, MONT. (LAT 48 12 25 LONG 115 52 09)** | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | .0 | 10 | 0 | 1.7 | 11 | .0 | 1 | 2 | 0 | 110 | -- |
| MAY , 1971 | | | | | | | | | | | |
| 04... | -- | 30 | 0 | 1.3 | 0 | .2 | 3 | 7 | 0 | 20 | 3 |

PEND OREILLE RIVER BASIN--Continued

| DATE | DIS-SOLVED FLUO-RIDE (F) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | DIS-SOLVED LEAD (PB) (UG/L) | DIS-SOLVED MAG-NE-SIUM (MG) (MG/L) | DIS-SOLVED MAN-GANESE (MN) (UG/L) | DIS-SOLVED MERCURY (HG) (UG/L) | DIS-SOLVED MOLY-BDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SELE-NIUM (SE) (UG/L) | DIS-SOLVED STRON-TIUM (SR) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12391500 - BULL RIVER NEAR HERON, MONT. (LAT 48 10 54 LONG 115 51 39)** | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | .1 | 20 | 0 | 2.2 | 0 | .2 | 0 | 2 | 0 | 120 | -- |
| MAY , 1971 | | | | | | | | | | | |
| 04... | -- | 60 | 0 | 2.0 | 0 | .2 | 0 | 4 | 20 | 10 | 8 |

| DATE | TIME | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | TOTAL CAD-MIUM (CD) (UG/L) | TOTAL COBALT (CO) (UG/L) | TOTAL COPPER (CU) (UG/L) | TOTAL IRON (FE) (UG/L) | TOTAL LEAD (PB) (UG/L) | TOTAL MAN-GANESE (MN) (UG/L) | TOTAL MERCURY (HG) (UG/L) | TOTAL ZINC (ZN) (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PEND OREILLE RIVER BASIN | | | | | | | | | | | |
| **12391500 - BULL RIVER NEAR HERON, MONT. (LAT 48 10 54 LONG 115 51 39)** | | | | | | | | | | | |
| NOV., 1970 | | | | | | | | | | | |
| 17... | 1500 | 57 | 5.0 | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY , 1971 | | | | | | | | | | | |
| 04... | 1100 | 686 | 4.5 | 2 | 5 | 20 | 540 | 10 | 20 | .5 | 50 |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

YELLOWSTONE RIVER BASIN--Continued

INSTANTANEOUS SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

06202598 WEST FORK STILLWATER RIVER NEAR NYE, MONT.

| DATE | TIME | TEMP-ERATURE (DEG C) | DIS-CHARGE (CFS) | SUS-PENDED SEDI-MENT (MG/L) | SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY) |
|---|---|---|---|---|---|
| OCT. | | | | | |
| 05... | 1400 | 10.5 | 57 | 3 | .46 |
| NOV. | | | | | |
| 12... | 1530 | 5.0 | 62 | 2 | .33 |
| DEC. | | | | | |
| 10... | 1500 | 1.0 | 46 | 6 | .75 |
| JAN. | | | | | |
| 12... | 1345 | .0 | 33 | 2 | .18 |
| FEB. | | | | | |
| 10... | 1455 | 1.5 | 36 | 3 | .29 |
| MAR. | | | | | |
| 10... | 1435 | 4.5 | 31 | 3 | .25 |
| APR. | | | | | |
| 12... | 1240 | 4.5 | 32 | 4 | .35 |
| MAY | | | | | |
| 11... | 1350 | 8.0 | 130 | 10 | 3.5 |
| JUNE | | | | | |
| 10... | 1600 | 8.0 | 899 | 69 | 167 |
| 24... | 1130 | -- | 850 | 49 | 112 |
| JULY | | | | | |
| 08... | 1440 | 7.5 | 448 | 8 | 9.7 |
| AUG. | | | | | |
| 16... | 1840 | 14.0 | 143 | 7 | 2.7 |
| SEP. | | | | | |
| 08... | 1145 | 7.5 | 128 | 1 | .35 |

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