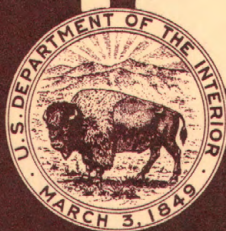
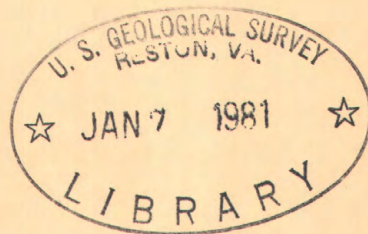


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1973  
pt. 2

# Water Resources Data for North Dakota

## Part 2. Water Quality Records



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

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



# CALENDAR FOR WATER YEAR 1973

1972

## OCTOBER

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

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		

## DECEMBER

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						

1973

## JANUARY

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			

## FEBRUARY

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			

## MARCH

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

## APRIL

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					

## MAY

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	

## JUNE

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

## JULY

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				

## AUGUST

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

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						



1973

**Water Resources Data  
for  
North Dakota**

Part 2. Water Quality Records



**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY**

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







Prepared in cooperation with  
North Dakota State Water Commission,  
Surveillance and Analysis Division, U.S. Environmental  
Protection Agency,  
International Joint Commission, U.S. Department  
of State  
Corps of Engineers, U.S. Army

Water resources records, 1973, for North Dakota are in  
the following reports of the U.S. Geological Survey:

1. Water Resources Data for North Dakota  
Part 1. Surface Water Records
2. Water Resources Data for North Dakota  
Part 2. Water Quality Records

Copies of this report may be obtained from  
District Chief, Water Resources Division  
U.S. Geological Survey  
Room 332, Federal Building  
P. O. Box 778  
Bismarck, North Dakota 58501







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IV WATER-QUALITY STATIONS, IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED

[Letters after station name designate type of data:  
(c), chemical; (t), water temperature; (s) sediment;  
(b), biological]

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Lake Winnipeg (Head of Nelson River)

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Part 2. Water Quality Records

INTRODUCTION

Water resources data for the 1973 water year for North Dakota include records of the chemical and physical characteristics of surface and ground water. Data on the quality of surface water (chemical, biological, temperature, and sediment) were collected from designated sampling sites at predetermined intervals such as once daily, weekly, monthly, or less frequently, and at some sites data were recorded on strip charts. Records are given for 131 sampling stations of which 40 are continuing-record stations, 21 are partial-record stations, and 70 are miscellaneous surface-water quality sites. Records of chemical analyses are also given for 29 miscellaneous ground-water quality sites. Locations of surface-water quality stations and counties where wells were sampled for ground-water quality are shown on plate 1. The records were collected by the Water Resources Division of the U.S. Geological Survey under the direction of R. C. Williams, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in North Dakota.

The Geological Survey has published records of chemical quality, water temperatures, and sediment 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 have been released by the Geological Survey in annual reports on a State-boundary basis. These reports are for limited distribution and are designed primarily for rapid release of data shortly after the end of the water year. 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. North Dakota State Water Commission  
Milo W. Hoisveen, Chief Engineer.

Agencies furnishing assistance in the form of funds or services were:

1. Other Federal agencies of the U.S. Department of the Interior for the development of the Missouri River basin.
2. Surveillance and Analysis Division, U.S. Environmental Protection Agency.

3. International Joint Commission, U.S. Department of State.
4. Corps of Engineers, U.S. Army.

#### DEFINITION OF TERMS

Terms related to water-quality and hydrologic data, as used in this report are defined below. See also table for converting English units to International System (SI) on page 23.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Acre-foot (ac-ft, AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet, or 325,851 gallons, or 1,233 cubic metres.

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

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms which produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C  $\pm$  1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

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

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are



capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at  $35^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$  on M-enterococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

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

Benthic organisms (invertebrates) are animals inhabiting the bottom of an aquatic environment. They include a number of different types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are frequently used as indicators of environmental quality because many have restricted mobility during their aquatic life phase, as well as a relatively long lifespan which allows for response to prevailing and changing water-quality conditions. Many benthic organisms inhabit specific types of environments, which if changed, result in changes in the composition of the benthic community.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per litre, used for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the weight per unit area or volume of habitat.

Ash weight is the weight or amount of residue present after the residue from the dry weight determination has been ashed in a muffle furnace at a temperature of  $500^{\circ}\text{C}$  for 1 hour. The ash weight values of zooplankton and phytoplankton are expressed in  $\text{g}/\text{m}^3$  (grams per cubic metre), and periphyton and benthic organisms in  $\text{g}/\text{m}^2$  (grams per square metre).

Dry weight refers to the weight of residue present after drying in an oven at  $60^{\circ}\text{C}$  for zooplankton and  $105^{\circ}\text{C}$  for periphyton, until the weight remains unchanged. This weight represents the total organic matter, ash and sediment, in the sample. Dry weight values are expressed in the same units as ash weight.

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, 646,317 gallons, or 2,446 cubic metres. It represents a runoff of 0.0372 inch from 1 square mile, or 0.3468 millimetre from 1 square kilometre.

Chemical oxygen demand (COD) indicates the quantity of oxidizable compounds in water and varies with water composition(s), temperature, period of contact, and other factors.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

Continuing-record station is a specified site which meets one or all conditions as listed:

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.
2. When water temperature records include observations taken once or more times daily.
3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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 (448.8 gallons per minute) or 0.02832 cubic metres per second (1.699 cubic metres per minute).

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

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

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the tables is "Discharge (cfs)."

Diversity index is a numerical rating of the variety of the aquatic organisms. The greater the number of different types of organisms, the greater the diversity. The formula for diversity index is

$$d = -\sum \frac{n_i}{n} \log_2 \frac{n_i}{n},$$

where  $n_i$  is the number of individuals per taxon, and  $n$  is the total number of individuals.

Drainage area of a stream at the specified location is that area, measured in a horizontal plane, enclosed by a topographic

divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

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 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 ( $\text{CaCO}_3$ ).

Macrophytes are large macroscopic plants in the aquatic environment. The most commonly occurring macrophytes are the rooted vascular plants that are usually arranged in zones and delineated by the extent of illumination and sedimentation. The dominant plant forms in these environmental gradients are (1) submersed rooted aquatics, (2) floating leaved, rooted aquatics, (3) emersed rooted aquatics, and (4) marginal mats. Growth of aquatic macrophytes depends on the availability of nutrients. In some waters nutrient enrichment results in excessive growth of macrophytes, and this accelerated productivity often results in a major nuisance condition and an important water-quality problem.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-pupa-adult or egg-nymph-adult.

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.

Micrograms per litre ( $\mu\text{g/l}$ ,  $\text{UG/L}$ ) is a unit expressing the concentration of chemical constituents in solution as weight (micrograms) of solute per unit volume (litre) of water. One thousand micrograms per litre is equivalent to one milligram per litre.

Milligrams per litre (mg/l, MG/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per litre represents the weight of solute per unit volume of water. Milligrams or micrograms per litre may be converted to milliequivalents (one thousandth of a gram-equivalent weight of a constituent) per litre by multiplying by the factors in table 1, page 7. Concentration of suspended sediment also is expressed in mg/l, and is based on the weight of sediment per litre of water-sediment mixture. Sediment concentrations may be converted to parts per million by using the factors in table 2, p. 7.

Nekton are the consumers of the aquatic environment consisting of large free-swimming organisms that are capable of sustained, directed mobility. The nekton community consists primarily of fish. In most lakes and streams fish are at the upper end of the food chain, and are often the most economically important organisms to man. Because they are dependent upon the life forms below them for food, the well-being of a fish population often is used as an index to water quality, and to the well-being of other aquatic organisms.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multi-celled and are counted according to the number of contained cells per sample volume, usually millilitres (ml) or litres (l).

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square metres (m<sup>2</sup>), acres, or hectares. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually millilitres (ml) or litres (l). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

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 millimetres (mm), of suspended sediment or bed material determined either by sieve or



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

<u>Ion</u>	<u>Multi- ply by</u>	<u>Ion</u>	<u>Multi- ply by</u>
Aluminum ( $\text{Al}^{+3}$ )*.....	0.11119	Iodide ( $\text{I}^{-1}$ ).....	0.00788
Ammonia ( $\text{NH}_4^{+1}$ ) as N..	.07139	Iron ( $\text{Fe}^{+3}$ )*.....	.05372
Barium ( $\text{Ba}^{+2}$ )*.....	.01456	Lead ( $\text{Pb}^{+2}$ )*.....	.00965
Bicarbonate ( $\text{HCO}_3^{-1}$ )..	.01639	Lithium ( $\text{Li}^{+1}$ ).....	.14411
Bromide ( $\text{Br}^{-1}$ ).....	.01251	Magnesium ( $\text{Mg}^{+2}$ ).....	.08226
Calcium ( $\text{Ca}^{+2}$ ).....	.04990	Manganese ( $\text{Mn}^{+2}$ )*.....	.03640
Carbonate ( $\text{CO}_3^{-2}$ ).....	.03333	Nickel ( $\text{Ni}^{+2}$ )*.....	.03406
Chloride ( $\text{Cl}^{-1}$ ).....	.02821	Nitrate ( $\text{NO}_3^{-1}$ ) as N...	.07139
Chromium ( $\text{Cr}^{+6}$ )*.....	.11539	Nitrate + Nitrite ( $\text{NO}_3^{-1}$ + $\text{NO}_2^{-1}$ ) as N.	.07139
Cobalt ( $\text{Co}^{+2}$ )*.....	.03394	Phosphate ( $\text{PO}_4^{-3}$ ) as P.	.03229
Copper ( $\text{Cu}^{+1}$ )*.....	.03148	Phosphorus ( $\text{PO}_4^{-3}$ ) as P.	.03229
Cyanide ( $\text{CN}^{-1}$ )*.....	.03844	Potassium ( $\text{K}^{+1}$ ).....	.02557
Fluoride ( $\text{F}^{-1}$ ).....	.05264	Sodium ( $\text{Na}^{+1}$ ).....	.04350
Hydrogen ( $\text{H}^{+1}$ ).....	.99209	Strontium ( $\text{Sr}^{+2}$ )*.....	.02283
Hydroxide ( $\text{OH}^{-1}$ ).....	.05880	Sulfate ( $\text{SO}_4^{-2}$ ).....	.02082
		Zinc ( $\text{Zn}^{+2}$ )*.....	.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	Di- vide by	Range of concentration in 1000 mg/l	Di- vide by	Range of concentration in 1000 mg/l	Di- vide by	Range of concentration in 1000 mg/l	Di- vide 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	427-440	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 grams per milliliter and a specific gravity of sediment of 2.65.

sedimentation methods. Sedimentation methods (pipet, visual-accumulation tube) determine fall diameter of particles in distilled water (chemically dispersed (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.

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

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton is a useful indicator of water quality.

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 litre. A pH of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity. The pH of most natural surface waters ranges between 6 and 8.

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water. Their concentrations are expressed as number of cells per millilitre (cells/ml).

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per millilitre (cells/ml).

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per millilitre (cells/ml).

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

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 times the concentration in milligrams per litre times 0.0027.

Total sediment discharge or total sediment load is the sum of the suspended-sediment discharge and the bedload discharge. It is the total quantity of sediment, as measured

by dry weight or volume, that is discharged during a given time (Colby and Hembree, 1955).

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 litre of water-sediment mixture (mg/l).

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

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 concentration in the water. Commonly, the amount of dissolved solids (mg/l) 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.

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

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.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The use of artificial substrates simplifies the community structure by standardizing the substrate from which each sample is



taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

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 temperatures on paper tape.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....	Animal
Phylum.....	Arthropoda
Class.....	Insecta
Order.....	Ephemeroptera
Family.....	Ephemeridae
<u>Genus.....</u>	<u>Hexagenia</u>
<u>Species.....</u>	<u>Hexagenia limbata</u>

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 multiplying the concentration in milligrams per litre by 0.00136.

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.

Irrigation network stations are surface-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."

National stream-quality accounting network is an accounting network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on river-basin accounting units designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of water-quality conditions nationwide on a year-to-year basis and (2) to detect and assess long-term changes in stream quality.

Pesticide program is a network of regularly sampled surface-water quality stations 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.

Pesticides are chemical compounds used to control the growth of undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Since the first application of DDT as an insecticide in the early 1930's, there have been almost 60,000 pesticide formulations registered, each containing at least one of the approximately 800 different basic pesticide compounds

(Goerlitz and Brown, 1972, p. 24). The United States annually produces about 1 billion pounds of these compounds. Although efforts are being made to substitute many of the chlorinated hydrocarbon pesticides with more specific, fast-acting, and easily degradable compounds, chlorinated hydrocarbon pesticides are still commonly used in many areas of the country.

Radiochemical program is a network of regularly sampled surface-water quality stations where additional samples are collected twice a year (at high and low flow) to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Radioisotopes are isotope forms of an element that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight, but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus. For example: Ordinary chloride is a mixture of isotopes having atomic weights 35 and 37, with the natural mixture having atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron (Rose, 1966). There are 275 isotopes of the 81 stable elements in addition to over 800 radioactive isotopes.

Radioisotopes that are determined in this program are those of uranium in micrograms per litre, radium as radium-226 in picocuries per litre, gross beta radiation as equivalent strontium/yttrium-90 in picocuries per litre, and gross alpha radiation as micrograms of uranium equivalent per litre.

A picocurie (PC/L, pCi/l) is one trillionth of the amount of radioactivity presented by a curie (Ci). A curie is the amount of radioactivity that yields  $3.7 \times 10^{10}$  radioactive disintegrations per second.

#### DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all main-stream stations are listed before the first main-stream 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 identification, each water-quality station, has been assigned a station number. 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 have the same number as the gaging 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 05051700, which appears to the left of the station name, includes the 2-digit part number "05" plus the 6-digit downstream order number "051700." In this report, the records are listed in downstream order by parts. The part number refers to an area whose boundaries coincide with certain natural drainage lines. Records in this report are in Part 5 (Hudson Bay and upper Mississippi River basins) and Part 6 (Missouri River basin). 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.

Downstream order station numbers are not assigned to sites where only random water-quality samples are taken. These sites are classified as water-quality miscellaneous sites and as a means of location and identification a 15-digit number consisting of latitude and longitude coordinates to the nearest second for each site plus a 2-digit sequential number are assigned. For example, the station number for a water-quality miscellaneous site with lat 47°01'25", long 101°55'27" would be 470125101552701. However, a surface-water quality miscellaneous site could be located at an established gaging station, active or inactive, in which case the existing downstream order station number would be used for identification.

#### WELL-NUMBERING SYSTEM

The well-numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude. The next seven digits denote degrees, minutes, and seconds of longitude. The last two digits are sequential numbers for wells having the same latitude and longitude to the nearest second. The latitude and longitude of each well is that of the southeast corner of the 10-acre tract described in the following paragraph. The system provides the geographic location of the well and a unique number for each well. See figure 1.

In order to compare data for wells in other publications, such as the county ground-water studies, the wells in this report are also numbered according to a system based on the location in the public land classification of the U.S. Bureau of Land Management. The system is illustrated in figure 2. The first numeral

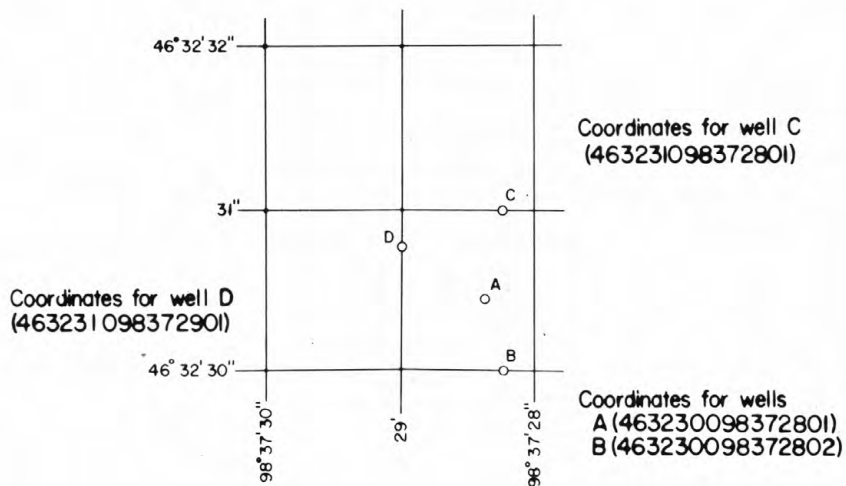


FIGURE 1.-- System of numbering wells (Latitude and Longitude)

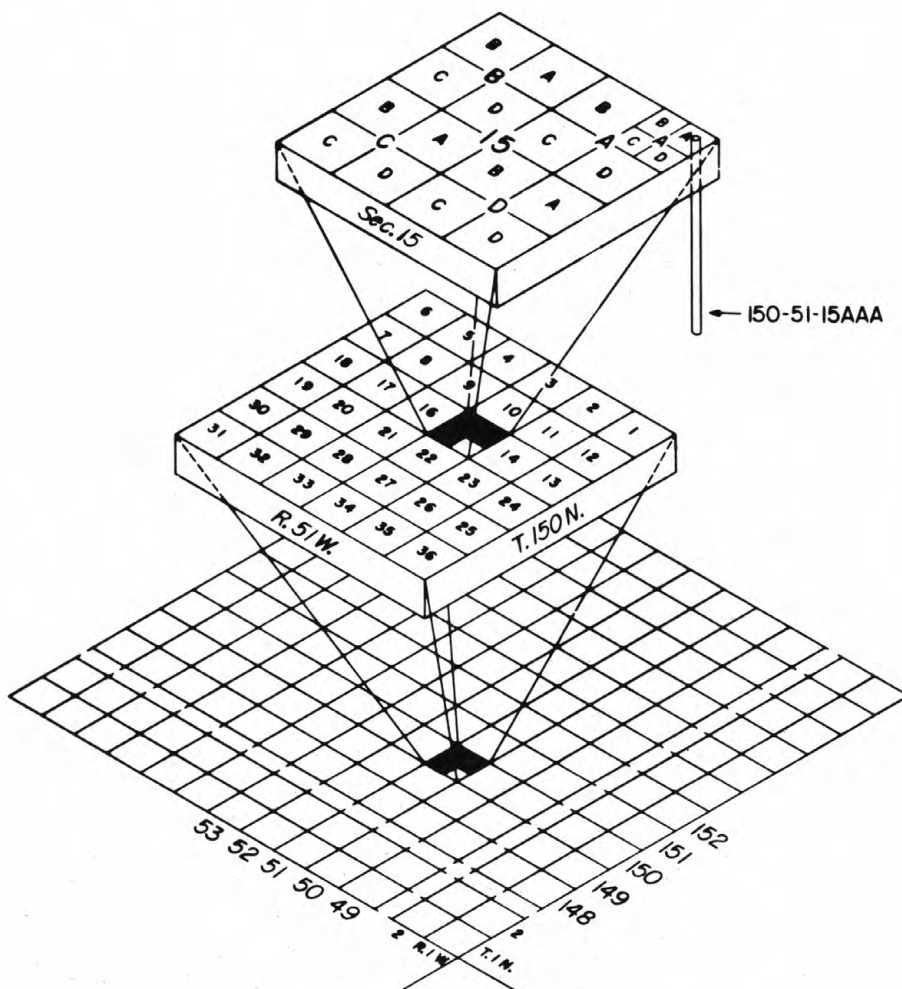


FIGURE 2.-- System of numbering wells (Township and Range)



denotes the township north of a base line, the second numeral denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the north-east, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre or 4-hectare tract). For example, well 150-51-15AAA is in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 15, T. 150 N., R. 51 W. Consecutive terminal numerals are added if more than one well is recorded within a 10-acre tract.

#### 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 North Dakota have been released in the report, "Water Resources Data for North Dakota, 1973, Part 1. Surface Water Records."

In this report the data from continuous-record stations include 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. For partial-record stations and miscellaneous sites, no description statements are given; however, if they are located at or near gaging stations, the location and drainage area can be found in Part 1 of this report. Also, miscellaneous ground-water quality sites have no description statements, but the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses.

Water-quality information is presented for chemical, biological, and microbiological quality, water temperature, and fluvial sediment. Chemical quality includes concentrations of individual, total, and dissolved constituents and certain properties or characteristics such as hardness, sodium-adsorption ratio, specific conductance, and pH. The biological information includes qualitative and quantitative analyses of plankton and bottom organisms. 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 report data for chemical constituents and concentrations of suspended sediment in milligrams per litre (mg/l) and water temperatures are given in degrees Celsius (°C). In waters with a density of 1.000 g/ml (grams per millilitre), parts per million and milligrams per litre can be considered equal. In waters with a density greater than 1.000 g/ml, values in milligrams per litre should be divided by the density to convert to parts per million (table 2). To convert temperature in degrees Celsius to degrees Fahrenheit, see table 3.

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	74	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

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32) \text{ or } ^{\circ}\text{F} = 9/5 (^{\circ}\text{C}) + 32.$$

In October 1968, the U.S. Geological Survey began reporting many of the chemical constituents as well as the minor elements in micrograms per litre instead of milligrams per litre. (See "Definition of Terms," p. 5 and 6 and table for converting English units to International System units, p. 23.)

### 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). The method for determining elemental constituents by emission spectrographic techniques is described by Barnett and Mallory (1971). Analysis of

pesticides, herbicides, and organic substances in water are described by Goerlitz and Lamar (1967), Lamar, Goerlitz, and Law (1965), and Goerlitz and Brown (1972). The collection and analysis of aquatic, biological, and microbiological samples are described by Slack and others (1973).

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 streams must be sampled at several verticals across the channel to determine accurately the solute load.

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

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.

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

Ground water does not change significantly during short periods of time; infrequent sampling and analysis of ground water adequately defines ground-water quality at a given site. Water samples from wells are analyzed individually.

#### Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for surface-water stations. For daily

stations, the water temperatures are taken each day at about the same time the sample is collected. Large streams have a small diurnal temperature change; small 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.

### 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 subdivided-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 subdivided-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 observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of 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

The annual series of water-supply papers that contain information on quality of surface waters in North Dakota are listed below.

<u>Water</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Water</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Water</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Water</u> <u>year</u>	<u>WSP</u> <u>No.</u>
1941	942	1950	1187	1959	1643	1968	2094
1942	950	1951	1198	1960	1743		2095
1943	970	1952	1251	1961	1883	1969	A2144
1944	1022	1953	1291	1962	1943		A2145
1945	1030	1954	1351	1963	1949	1970	A2154
1946	1050	1955	1401	1964	1956		A2155
1947	1102	1956	1451	1965	1963	1971	A2164
1948	1132	1957	1521	1966	1993		A2165
1949	1162	1958	1572	1967	2013		

A In press.

## SELECTED REFERENCES

- American Public Health Association, and others, 1971, Standard methods for the examination of water and wastewater, 13th ed.: Am. Public Health Assoc., New York, 874 p.
- Barker, F. B., and Johnson, J. O., 1964, Determination of radium in water: U.S. Geol. Survey Water-Supply Paper 1696-B, 29 p.
- Barker, F. B., and others, 1965, Determination of uranium in natural water: U.S. Geol. Survey Water-Supply Paper 1696-C, 25 p.
- Barker, F. B., and Robinson, B. P., 1963, Determination of beta activity in water: U.S. Geol. Survey Water-Supply Paper 1696-A, 32 p.
- Barnett, P. R., and Mallory, E. C., Jr., 1971, Determination of minor elements in water by emission spectroscopy: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. A2, 31 p.
- Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. A1, 160 p.
- Colby, B. R., 1963, Fluvial sediments--a summary of source, transportation, deposition, and measurement of sediment discharge: U.S. Geol. Survey Bull. 1181-A, 47 p.



- Colby, B. R., and Hembree, C. H., 1955, Computations of total sediment discharge, Niobrara River near Cody Nebraska: U.S. Geol. Survey Water-Supply Paper 1357, 187 p.
- Colby, B. R., and Hubbell, D. W., 1961, Simplified methods for computing total sediment discharge with the modified Einstein procedure: U.S. Geol. Survey Water-Supply Paper 1593, 17 p.
- Goerlitz, D. F., and Brown, Eugene, 1972, Methods for analysis of organic substances in water: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. A3, 40 p.
- Goerlitz, D. F., and Lamar, W. L., 1967, Determination of phenoxy acid herbicides in water by electron-capture and micro-coulometric gas chromatography: U.S. Geol. Survey Water-Supply Paper 1817-C, 21 p.
- Guy, H. R., 1969, Laboratory theory and methods for sediment analysis: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. C1, 58 p.
- \_\_\_\_\_, 1970, Fluvial sediment concepts: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 3, ch. C1, 55 p.
- Guy, H. P., and Norman, V. W., 1970, Field methods for measurement of fluvial sediment: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 3, ch. C2, 59 p.
- Hem, J. D., 1970, Study and interpretation of the chemical characteristics of natural water, 2d ed.: U.S. Geol. Survey Water-Supply Paper 1473, 363 p.
- Lamar, W. L., Goerlitz, D. F., and Law, L. M., 1965, Identification and measurement of chlorinated organic pesticides in water by electron-capture gas chromatography: U.S. Geol. Survey Water-Supply Paper 1817-B, 12 p.
- Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.
- Lohman, S. W., and others, 1972, Definitions of selected ground-water terms--revisions and conceptual refinements: U.S. Geol. Survey Water-Supply Paper 1988, p. 2.
- Porterfield, George, 1972, Computations of fluvial-sediment discharge: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 3, ch. C3, 66 p.
- Ritter, J. R., and Helley, E. J., 1969, Optical method for determining particle sizes of coarse sediment: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. C3, 33p. (open file).

- Rose, Arthur and Elizabeth, 1966, The condensed chemical dictionary: New York, Reinhold Pub. Corp., 7th ed., p. 257.
- Slack, K. V., and others, 1973, Methods for collection and analysis of aquatic, biological, and microbiological samples: U.S. Geol. Survey Tech. Water-Resources Inv., bk. 5, ch. A4, 165 p.
- 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.
- \_\_\_\_\_. 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.
- \_\_\_\_\_. 1957, Some fundamentals of particle-size analysis: Rept. 12.
- \_\_\_\_\_. 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.

Table 4.--Factors for converting English units to International System (SI) units

The following factors may be used to convert the English units published herein to the International System of Units (SI). Subsequent reports will contain both the English and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

<u>Multiply English units</u>	<u>By</u>	<u>To obtain SI units</u>
<u>Length</u>		
Inches (in)	25.4	millimetres (mm)
	.0254	metres (m)
Feet (ft)	.3048	metres (m)
Miles (mi)	1.609	kilometres (km)
<u>Area</u>		
Acres	4047	square metres (m <sup>2</sup> )
	.4047	*hectares (ha)
	.4047	square hectometre (hm <sup>2</sup> )
	.004047	square kilometres (km <sup>2</sup> )
Square miles (mi <sup>2</sup> )	2.590	square kilometres (km <sup>2</sup> )
<u>Volume</u>		
Gallons (gal)	3.785	**litres (l)
	3.785	cubic decimetres (dm <sup>3</sup> )
	3.785x10 <sup>-3</sup>	cubic metres (m <sup>3</sup> )
Million gallons (10 <sup>6</sup> gal)	3785	cubic metres (m <sup>3</sup> )
	3.785x10 <sup>-3</sup>	cubic hectometres (hm <sup>3</sup> )
Cubic feet (ft <sup>3</sup> )	28.32	cubic decimetres (dm <sup>3</sup> )
	.02832	cubic metres (m <sup>3</sup> )
Cfs-day (ft <sup>3</sup> /s-day)	2447	cubic metres (m <sup>3</sup> )
	2.447x10 <sup>-3</sup>	cubic hectometres (hm <sup>3</sup> )
Acre-feet (acre-ft)	1233	cubic metres (m <sup>3</sup> )
	1.233x10 <sup>-3</sup>	cubic hectometres (hm <sup>3</sup> )
	1.233x10 <sup>-6</sup>	cubic kilometres (km <sup>3</sup> )
<u>Flow</u>		
Cubic feet per second (ft <sup>3</sup> /s)	28.32	litres per second (l/s)
	28.32	cubic decimetres per second (dm <sup>3</sup> /s)
	.02832	cubic metres per second (m <sup>3</sup> /s)
Gallons per minute (gal/min)	.06309	litres per second (l/s)
	.06309	cubic decimetres per second (dm <sup>3</sup> /s)
	6.309x10 <sup>-5</sup>	cubic metres per second (m <sup>3</sup> /s)
Million gallons per day (Mgal/d)	43.81	cubic decimetres per second (dm <sup>3</sup> /s)
	.04381	cubic metres per second (m <sup>3</sup> /s)
<u>Mass</u>		
Ton (short)	.9072	tonne (t)

\*The unit hectare is approved for use with the International System (SI) for a limited time. See NBS Special Bulletin 330, p. 15, 1972 edition.

\*\*The unit litre is accepted for use with the International System (SI). See NBS Special Bulletin 330, p. 13, 1972 edition.

## WATER QUALITY RECORDS

## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05051510 RED RIVER OF THE NORTH BELOW WAHPETON, N. DAK.

LOCATION.--Lat 46°22'30", long 96°39'25", in NE¼NE¼ sec.1, T.133 N., R.47 W., Richland County, at county highway bridge about 7 mi (11 km) northwest of Wahpeton, 12.4 mi (20.0 km) downstream from confluence of Bois de Sioux and Otter Tail Rivers, and at mile 536.3 (kilometre 862.9).

DRAINAGE AREA.--4,020 mi<sup>2</sup> (10,410 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: July 1969 to current year.

REMARKS.--Records of discharge are given for station 05051500 Red River of the North at Wahpeton, N. Dak.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
NOV.										
02...	0930	370	36	29	--	240	0	197	25	5.1
30...	0900	296	41	30	--	265	0	217	25	4.8
JAN.										
10...	0900	326	43	32	12	299	0	245	32	8.9
MAR.										
08...	0900	502	45	31	--	272	0	223	48	6.5
APR.										
04...	1300	784	55	38	21	202	12	186	140	8.7
MAY										
02...	1500	392	43	29	--	211	24	213	32	5.8
30...	1430	446	53	38	--	232	16	217	120	8.4
JUNE										
27...	1030	211	39	28	14	247	2	206	37	7.2
JULY										
24...	1330	138	42	29	--	221	31	233	29	5.9
AUG.										
29...	1000	75	--	--	--	--	--	--	--	--
SEP.										
25...	1200	182	39	28	11	249	0	204	32	5.5

DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)
NOV.										
02...	--	.00	.04	.04	.03	282	.38	282	210	12
30...	--	.01	.05	.03	.02	272	.37	217	230	9
JAN.										
10...	.2	.21	.72	.31	.21	308	.42	271	240	0
MAR.										
08...	--	.25	.15	.11	.04	290	.39	393	240	17
APR.										
04...	.2	.20	.14	.15	.04	430	.58	910	290	110
MAY										
02...	--	.02	.10	.08	.01	283	.38	300	230	14
30...	--	.00	.09	.05	.00	407	.55	490	290	72
JUNE										
27...	.3	.02	.09	.29	.11	285	.39	162	210	7
JULY										
24...	--	.07	.09	.10	.05	266	.36	99.1	220	0
AUG.										
29...	--	--	--	--	--	--	--	--	--	--
SEP.										
25...	.3	.13	.09	.18	.03	254	.35	125	210	8

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)	IMMF- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)
NOV.										
02...	--	410	8.4	2.0	.0	12.0	92	5.0	280	B41
30...	--	450	8.7	.0	-3.0	14.2	100	3.9	140	B15
JAN.										
10...	.3	450	8.1	.0	-15.0	10.0	71	4.0	840	830
MAR.										
08...	--	470	8.1	.5	.0	12.0	86	--	880	510
APR.										
04...	.5	590	8.5	7.5	7.5	14.0	121	5.5	150	44
MAY										
02...	--	420	8.6	11.0	9.5	12.2	114	--	230	B25
30...	--	600	8.5	21.5	24.0	12.4	144	5.2	130	B30
JUNE										
27...	.4	440	8.2	21.5	17.5	6.6	77	3.0	560	180
JULY										
24...	--	400	8.5	23.0	26.0	9.2	110	3.8	260	160
AUG.										
29...	--	460	8.3	25.0	23.0	6.6	81	3.4	950	160
SEP.										
25...	.3	420	8.6	15.5	18.0	7.0	72	2.1	8000	2200

B - Results based on colony count outside the acceptable range.



## 05053000 WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.

LOCATION.--Lat 46°28'05", long 96°47'00", in NE¼NE¼ sec.36, T.135 N., R.49 W., Richland County, at gaging station at county highway bridge, 0.8 mi (1.3 km) upstream from rubble masonry dam, 3.2 mi (5.1 km) northwest of Abercrombie, and 7 mi (11 km) downstream from Antelope Creek.

DRAINAGE AREA.--2,080 mi<sup>2</sup> (5,390 km<sup>2</sup>), of which 590 mi<sup>2</sup> (1,530 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: August 1955 to June 1956, October 1966 to current year.

Specific conductance: October 1966 to current year.

Water temperatures: October 1966 to current year.

EXTREMES.--Current year:

Dissolved solids: Maximum, 1,620 mg/l Feb. 1-28; minimum, 514 mg/l Mar. 1-31.

Hardness: Maximum, 860 mg/l Feb. 1-28, minimum, 290 mg/l Mar. 1-31.

Specific conductance: Maximum daily, 2,600 micromhos Feb. 23-24; minimum daily, 303 micromhos Mar. 7.

Water temperatures: Maximum daily, 29.5°C Aug. 7; minimum daily, freezing point on many days during winter months.

Period of record: 1966 to current year.

Dissolved solids: Maximum, 2,840 mg/l Feb. 1-29, 1972; minimum, 182 mg/l June 15-19, 1967.

Hardness: Maximum, 1,200 mg/l Feb. 1-29, 1972; minimum, 110 mg/l June 15-19, 1967.

Specific conductance: Maximum daily, 3,840 micromhos Mar. 7, 1972; minimum daily, 141 micromhos Apr. 10, 1969.

Water temperatures: Maximum daily, 29.5°C Aug. 7, 1973; minimum daily, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. No flow Oct. 1 to Nov. 11 and Aug. 14 to end of water year. Maximum observed during water year: Dissolved solids, 1,660 mg/l Feb. 7; hardness, 890 mg/l Feb. 7.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	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 (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS DUE AT 180 C (MG/L)
NOV. 12-30	3.0	130	69	160	14	500	0	410	1300
DEC. 01-31	2.6	140	88	170	16	630	0	517	1540
JAN. 01-31	2.0	160	85	160	15	692	0	568	1390
FEB. 01-28	.78	180	100	200	17	732	0	600	1620
MAR. 01-31	102	66	30	49	9.1	182	0	149	514
APR. 01-30	25	100	56	130	14	340	0	279	1040
MAY 01-31	10	120	70	160	15	452	0	371	1230
JUNE 01-30	8.8	120	67	130	16	416	0	341	1120
JULY 01-31	9.8	70	33	77	9.9	188	0	154	619
AUG. 01-03	.01	77	42	100	14	264	0	217	698
WTD. AVG. TIME WTD.	--	81	41	80	11	256	0	210	720
AVG. TONS PER DAY	14	116	64	133	14	437	0	358	1100
PER DAY	--	3.0	1.5	3.0	.4	9.6	0	7.8	27

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH
NOV. 12-30	1.77	10.5	610	200	36	2.8	1670	8.1
DEC. 01-31	2.09	10.8	710	200	34	2.8	1900	8.0
JAN. 01-31	1.89	7.51	750	180	31	2.5	1850	8.2
FEB. 01-28	2.20	3.41	860	260	33	3.0	2150	7.8
MAR. 01-31	.70	142	290	140	26	1.3	762	7.7
APR. 01-30	1.41	70.2	480	200	36	2.6	1420	7.7
MAY 01-31	1.67	33.2	590	220	36	2.9	1710	8.1
JUNE 01-30	1.52	26.6	580	230	32	2.4	1490	8.2
JULY 01-31	.84	16.4	310	160	34	1.9	910	8.0
AUG. 01-03	.95	.02	370	150	36	2.3	1170	7.9
WTD. AVG. TIME WTD.	.98	--	374	163	--	1.8	1020	7.8
AVG. TONS PER DAY	1.50	--	552	193	33	2.4	1500	8.0
PER DAY	--	--	--	--	--	--	--	--

## RED RIVER OF THE NORTH BASIN

05053000 WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)
NOV. 30...	1130	4.2	26	--	--	--	140	78	170	12	521	0
FEB. 07...	1600	1.1	43	--	--	--	190	100	180	16	802	0
MAR. 07...	1330	11	24	--	--	--	150	80	150	15	560	0
APR. 05...	1010	36	2.3	20	1400	30	79	49	110	12	238	0
MAY 02...	0935	16	13	--	--	--	120	65	160	14	453	0
JUNE 12...	2035	4.8	21	--	--	--	120	69	140	17	419	0
JULY 11...	1030	5.6	23	--	--	--	110	55	130	6.9	256	0
AUG. 07...	1830	.04	24	--	--	--	73	42	110	14	256	0

DATE	ALKALINITY AS CaCO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLORIDE (CL) (MG/L)	DIS- SOLVED FLUORIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA+MG/L)	NON-CARBONATE HARD- NESS (MG/L)	PERCENT SODIUM
NOV. 30...	427	530	64	.6	.00	.21	1320	1.80	15.0	670	240	35
FEB. 07...	658	580	80	.6	.05	.34	1660	2.26	4.93	890	230	30
MAR. 07...	459	500	66	.5	.46	.16	1310	1.78	38.9	700	240	31
APR. 05...	195	390	40	.3	.02	.03	854	1.16	83.0	400	200	37
MAY 02...	372	500	55	.5	.02	.28	1180	1.60	51.0	570	200	37
JUNE 12...	344	480	52	.6	.06	.28	1150	1.56	14.9	580	240	33
JULY 11...	210	470	79	.6	.04	.27	1130	1.54	17.1	500	290	36
AUG. 07...	210	310	63	.4	.03	.01	812	1.10	.09	360	150	39

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/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)
NOV. 30...	2.9	1810	7.6	.0	30	--	--	--	--	470	--	--
FEB. 07...	2.6	2230	7.3	.0	30	--	--	--	--	500	--	--
MAR. 07...	2.5	1780	7.6	.0	40	--	--	--	--	380	--	--
APR. 05...	2.4	1200	8.1	7.5	30	.01	7	0	0	210	0	0
MAY 02...	2.9	1600	8.3	8.0	20	--	--	--	--	420	--	--
JUNE 12...	2.5	1550	7.9	22.5	30	--	--	--	--	420	--	--
JULY 11...	2.5	1450	7.8	25.5	50	--	--	--	--	350	--	--
AUG. 07...	2.5	1130	8.1	29.5	30	--	--	--	--	260	--	--

[illegible]

## RED RIVER OF THE NORTH BASIN

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05053000 WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1600	1670	2120	338	1360	1650	1650	1680	1120	---
2	---	---	1680	1670	2140	337	1340	1640	1640	1650	1130	---
3	---	---	1720	1670	2160	342	1340	1630	1720	1620	1140	---
4	---	---	1730	1670	2130	367	1380	1660	1600	613	---	---
5	---	---	1670	1720	2170	350	1330	1690	1270	770	---	---
6	---	---	1720	1720	2170	320	1450	1700	1180	795	---	---
7	---	---	1680	1760	2170	303	1500	1660	1200	1160	1130	---
8	---	---	1830	1780	2190	519	1540	1700	1300	1480	---	---
9	---	---	1850	1760	2160	1100	1690	1650	1440	1490	---	---
10	---	---	1860	1840	2170	1100	1650	1650	1550	1490	---	---
11	---	---	1960	1800	2230	1100	1620	1670	1570	1400	---	---
12	---	1320	1920	1800	2260	1100	1680	1710	1580	1240	---	---
13	---	1340	1890	1850	2290	812	1700	1710	1580	1230	---	---
14	---	1410	2010	1850	2290	683	1700	1740	1580	1200	---	---
15	---	1410	2070	1870	2380	597	1700	1900	1600	1180	---	---
16	---	1530	2080	1900	2390	564	1720	1900	1600	1280	---	---
17	---	1530	2040	1860	2460	549	1740	1860	1630	1180	---	---
18	---	1580	2000	1940	2460	535	1760	1840	1620	1200	---	---
19	---	1560	2150	1950	2460	628	1740	1810	1630	1260	---	---
20	---	1780	2150	1950	2530	734	1830	1780	1650	1200	---	---
21	---	1820	2160	1950	2530	822	1830	1910	1670	1200	---	---
22	---	1980	2080	1950	2530	995	1850	1910	1660	1200	---	---
23	---	1990	2010	1960	2600	837	1880	1940	1680	1200	---	---
24	---	1830	2070	2040	2600	1000	1890	1910	1700	1210	---	---
25	---	1740	1910	2030	2590	1060	1880	1820	1690	1170	---	---
26	---	1780	1920	2030	1190	1060	1900	1840	1670	1180	---	---
27	---	1790	1840	2060	1240	1080	1900	1820	1700	1180	---	---
28	---	1790	1770	2050	1190	1110	1860	1780	1720	1160	---	---
29	---	1790	1650	2070	---	1150	1860	1700	1720	1160	---	---
30	---	1790	1640	2140	---	1010	1890	1810	1710	1160	---	---
31	---	---	1640	2170	---	1100	---	1810	---	1180	---	---
MONTH	---	---	1880	1890	2210	761	1680	1770	1580	1230	---	---

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	0.0	0.0	0.0	0.5	7.0	9.5	20.5	19.5	21.5	---
2	---	---	0.0	0.0	0.0	0.5	7.0	10.5	22.0	22.0	21.0	---
3	---	---	0.0	0.0	0.0	0.5	6.5	12.0	21.0	23.0	21.5	---
4	---	---	0.0	0.0	0.0	0.5	7.0	11.0	20.5	22.5	---	---
5	---	---	0.0	0.0	0.0	0.5	7.5	12.5	20.0	23.5	---	---
6	---	---	0.0	0.0	0.0	0.5	6.5	14.0	21.0	25.0	---	---
7	---	---	0.0	0.0	0.0	0.5	5.5	15.0	19.5	26.5	29.5	---
8	---	---	0.0	0.0	0.5	0.5	4.5	15.0	20.5	26.0	---	---
9	---	---	0.0	0.0	0.5	0.5	3.5	16.0	22.0	25.5	---	---
10	---	---	0.0	0.0	0.5	0.5	3.5	15.0	22.0	25.0	---	---
11	---	---	0.0	0.0	0.5	0.5	5.5	14.0	21.5	25.0	---	---
12	---	0.5	0.0	0.0	0.5	0.5	7.0	14.0	21.0	24.5	---	---
13	---	1.0	0.0	0.0	0.5	1.0	8.0	13.5	21.0	24.0	---	---
14	---	0.5	0.0	0.0	0.5	1.0	10.0	12.0	22.5	21.0	---	---
15	---	0.5	0.0	0.0	0.5	1.0	9.0	12.5	22.5	21.0	---	---
16	---	1.0	0.0	0.0	0.5	1.0	7.5	13.0	24.0	24.0	---	---
17	---	1.0	0.0	0.0	0.5	1.0	8.5	14.0	24.0	24.0	---	---
18	---	1.0	0.0	0.0	0.5	1.0	10.5	15.0	22.5	24.0	---	---
19	---	0.5	0.0	0.0	0.5	1.0	13.0	16.5	20.0	24.0	---	---
20	---	0.5	0.0	0.0	0.5	1.0	13.0	17.0	18.0	22.0	---	---
21	---	0.5	0.0	0.0	0.5	1.0	13.5	18.0	18.5	21.0	---	---
22	---	0.5	0.0	0.0	0.5	1.5	10.5	19.0	19.5	21.0	---	---
23	---	0.5	0.0	0.0	0.5	4.0	10.5	19.5	21.5	21.0	---	---
24	---	0.0	0.0	0.0	0.5	5.0	10.0	17.0	22.0	21.5	---	---
25	---	0.0	0.0	0.0	0.5	5.5	10.0	14.5	22.0	22.0	---	---
26	---	0.0	0.0	0.0	0.5	6.0	11.0	14.0	22.5	22.0	---	---
27	---	0.0	0.0	0.0	0.5	7.0	12.0	15.0	22.0	21.5	---	---
28	---	0.0	0.0	0.0	0.5	6.0	11.0	18.0	20.0	19.5	---	---
29	---	0.0	0.0	0.0	---	5.0	10.5	19.0	19.0	20.0	---	---
30	---	0.0	0.0	0.0	---	5.5	10.0	19.5	19.0	20.5	---	---
31	---	---	0.0	0.0	---	6.0	---	19.5	---	20.5	---	---
MONTH	---	---	0.0	0.0	0.5	2.0	8.5	15.0	21.0	22.5	---	---

## RED RIVER OF THE NORTH BASIN

05054000 RED RIVER OF THE NORTH AT FARGO, N. DAK.  
(Radiochemical station)

LOCATION.--Lat 46°51'40", long 96°47'00", in NW¼NE¼ sec.18, T.139 N., R.48 W., Cass County, at gaging station at city waterplant on 4th St. S. in Fargo, 25 mi (40 km) upstream from mouth of Sheyenne River, and at mile 453 (kilometre 729).

DRAINAGE AREA.--6,800 mi<sup>2</sup> (17,600 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: October 1955 to September 1973 (discontinued).

Specific conductance: October 1955 to September 1973 (discontinued).

Water temperatures: October 1955 to September 1973 (discontinued).

EXTREMES.--Current year:

Dissolved solids: Maximum, 420 mg/l Apr. 1-30; minimum observed, 244 mg/l Oct. 1-31.

Hardness: Maximum, 280 mg/l Apr. 1-30, June 1-30; minimum, 210 mg/l Oct. 1-31, Nov. 1-30.

Specific conductance: Maximum daily, 893 micromhos June 4; minimum daily, 358 micromhos Sept. 1.

Water temperatures: Maximum daily, 26.0°C July 11-13; minimum daily, 1.5° on many days during winter months.

Period of record:

Dissolved solids (1955-58, 1959-73): Maximum, 650 mg/l May 6-9, 1958; minimum, 174 mg/l Dec. 1-2, 1955.

Hardness: Maximum, 420 mg/l May 6-9, 1968; 119 mg/l Apr. 6-17, 1962.

Specific conductance: Maximum daily, 960 micromhos May 6, 1958; minimum daily, 220 micromhos Sept. 7, 1971.

Water temperatures: Maximum daily, 28.0°C on several days in 1957, 1960, and 1964; minimum daily, 1.0°C on many days during the winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year:

Dissolved solids, 431 mg/l Apr. 4; hardness, 300 mg/l Apr. 4; minimum observed during water year: temperature, 0.0°C Nov. 28, Jan. 10 and Mar. 7. Water temperature, measured in waterplant, modified slightly in transit.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.									
01-31	437	38	29	9.5	--	248	0	203	244
NOV.									
01-30	360	38	29	8.8	--	254	0	208	252
DEC.									
01-31	394	42	32	9.8	--	281	0	230	300
JAN.									
01-31	384	44	33	11	--	280	0	230	304
FEB.									
01-28	441	47	34	14	--	297	0	244	338
MAR.									
01-31	978	51	32	18	--	211	0	173	383
APR.									
01-30	541	53	37	22	6.1	230	0	189	420
MAY									
01-31	338	47	32	16	--	266	0	218	320
JUNE									
01-30	283	51	37	20	--	269	0	221	382
JULY									
01-31	155	45	31	15	--	256	0	210	315
AUG.									
01-31	116	40	30	12	--	260	0	213	306
SEP.									
01-30	120	40	28	12	4.5	231	0	189	--
WTD. AVG.	--	46	32	15	--	251	0	206	335
TIME WTD.									
AVG.	379	45	32	14	--	257	0	210	324
TONS									
PER DAY	--	47	33	15	--	256	0	210	--

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH
OCT.								
01-31	.33	288	210	11	--	.3	424	7.4
NOV.								
01-30	.34	245	210	6	--	.3	428	8.1
DEC.								
01-31	.41	319	240	6	--	.3	483	8.2
JAN.								
01-31	.41	315	250	16	--	.3	490	8.1
FEB.								
01-28	.46	402	260	14	--	.4	542	8.0
MAR.								
01-31	.52	1010	260	86	--	.5	568	7.5
APR.								
01-30	.57	613	280	96	14	.6	630	7.7
MAY								
01-31	.44	292	250	31	--	.4	522	8.0
JUNE								
01-30	.52	292	280	59	--	.5	604	8.1
JULY								
01-31	.43	132	240	30	--	.4	510	8.1
AUG.								
01-31	.42	95.8	220	10	--	.4	475	7.7
SEP.								
01-30	--	--	220	26	11	.4	460	8.2
WTD. AVG.	.46	--	249	43	--	.4	525	7.8
TIME WTD.								
AVG.	.44	--	243	33	--	.4	511	7.9
TONS								
PER DAY	--	--	--	--	--	--	--	--



05054000 RED RIVER OF THE NORTH AT FARGO, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)
NOV.												
01...	0930	454	12	--	--	--	36	30	9.1	3.8	238	10
28...	1730	333	9.8	--	--	--	40	31	9.0	3.8	259	0
JAN.												
10...	1400	430	16	--	--	--	45	33	10	4.1	295	0
MAR.												
07...	1430	500	16	--	--	--	49	35	18	5.3	295	0
APR.												
04...	1800	802	5.6	10	50	0	57	38	22	6.4	202	14
MAY												
03...	0945	306	3.7	--	--	--	50	33	18	4.7	268	0
31...	1100	461	5.0	--	--	--	42	30	15	4.2	244	7
JUNE												
26...	1530	161	12	--	--	--	42	31	11	4.6	264	0
JULY												
25...	1000	101	14	--	--	--	43	30	12	4.2	261	0
AUG.												
28...	1530	48	3.2	--	--	--	38	31	11	4.1	227	17
SEP.												
26...	0900	220	7.2	0	10	10	45	33	14	4.2	239	0

DATE	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	TOTAL FILTERABLE RESIDUE (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	HARDNESS (CA, MG) (MG/L)
NOV.												
01...	212	29	5.4	.3	.01	.01	254	280	.35	311	14	210
28...	212	28	5.3	.2	.04	.06	282	270	.38	254	2	230
JAN.												
10...	242	26	5.3	.3	.18	.08	308	240	.42	358	3	250
MAR.												
07...	242	68	9.8	.3	.49	.10	360	380	.49	486	11	270
APR.												
04...	189	140	9.1	.2	.04	.02	431	480	.59	933	61	300
MAY												
03...	220	76	9.4	.2	.03	.04	354	370	.48	292	52	260
31...	212	52	7.2	.3	.00	.01	294	290	.40	366	20	230
JUNE												
26...	217	41	6.3	.3	.03	.08	303	310	.41	132	68	230
JULY												
25...	214	40	6.4	.3	.10	.13	288	300	.39	78.5	52	230
AUG.												
28...	215	38	5.5	.3	.03	.03	289	350	.39	37.5	20	220
SEP.												
26...	196	79	5.3	.1	.03	.15	320	340	.44	190	27	250

DATE	NON-CARBONATE HARDNESS (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	CYANIDE (CN) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BERYLLIUM (BE) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
NOV.												
01...	2	8	.3	427	8.8	3.0	20	--	--	--	--	90
28...	15	8	.3	425	8.2	.0	7	--	--	--	--	60
JAN.												
10...	6	8	.3	473	8.3	.0	9	--	--	--	--	100
MAR.												
07...	24	13	.5	586	8.0	.0	10	--	--	--	--	90
APR.												
04...	110	14	.6	645	8.6	8.0	20	.00	2	600	0	100
MAY												
03...	41	13	.5	548	8.4	11.0	20	--	--	--	--	90
31...	17	12	.4	478	8.4	19.5	10	--	--	--	--	80
JUNE												
26...	16	9	.3	481	7.9	22.5	20	--	--	--	--	80
JULY												
25...	17	10	.3	464	8.2	23.0	20	--	--	--	--	100
AUG.												
28...	8	10	.3	445	8.8	25.5	6	--	--	--	--	140
SEP.												
26...	53	11	.4	513	8.1	13.5	20	.00	4	100	0	110

## RED RIVER OF THE NORTH BASIN

05054000 RED RIVER OF THE NORTH AT FARGO, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	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 LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED NICKEL (NI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)
NOV.											
01...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
JAN.											
10...	--	--	--	--	--	--	--	--	--	--	--
MAR.											
07...	--	--	--	--	--	--	--	--	--	--	--
APR.											
04...	1	0	2	32	0	20	.0	1	7	5	0
MAY											
03...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JUNE											
26...	--	--	--	--	--	--	--	--	--	--	--
JULY											
25...	--	--	--	--	--	--	--	--	--	--	--
AUG.											
28...	--	--	--	--	--	--	--	--	--	--	--
SEP.											
26...	0	0	0	6	1	30	.0	3	6	7	0

DATE	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENDE D GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENDE D GROSS BETA AS CS-137 (PC/L)	DIS- SOLVED GROSS BETA AS AS SR90 /Y90 (PC/L)	SUS- PENDE D GROSS BETA AS AS SR90 /Y90 (PC/L)	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)
NOV.											
01...	--	--	--	5.5	.6	10	.6	8.2	.5	.07	.4
28...	--	--	--	<3.0	<.4	10	<.4	8.2	<.4	.05	.5
JAN.											
10...	--	--	--	3.4	<.4	8.9	.6	7.2	.5	.05	.5
MAR.											
07...	--	--	--	5.4	<.4	13	.9	11	.8	.06	.9
APR.											
04...	200	.1	10	5.6	2.4	13	3.5	12	3.1	.07	3.5
MAY											
03...	--	--	--	9.4	2.0	13	3.0	11	2.5	.08	1.8
31...	--	--	--	<4.0	1.0	10	1.8	8.1	1.6	.09	.8
JUNE											
26...	--	--	--	4.2	4.5	11	4.0	9.1	3.3	.09	1.0
JULY											
25...	--	--	--	4.8	3.1	12	3.6	9.5	3.0	.08	1.1
AUG.											
28...	--	--	--	<6.0	.6	12	1.1	10	.9	.08	.9
SEP.											
26...	210	6.0	20	6.5	1.4	12	2.1	9.7	1.9	.11	1.3

## RED RIVER OF THE NORTH BASIN

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05054000 RED RIVER OF THE NORTH AT FARGO, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT AT 0800)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	571	413	433	483	540	637	755	551	514	454	473	358
2	548	408	429	489	479	527	709	571	552	455	473	378
3	527	407	424	474	507	570	740	560	760	454	473	400
4	566	406	427	472	542	568	720	577	893	480	483	415
5	476	403	443	463	551	562	725	599	780	500	492	432
6	475	404	468	462	507	557	718	577	710	482	517	445
7	419	404	453	462	525	547	709	561	693	477	509	450
8	413	412	464	465	521	510	710	540	661	485	498	465
9	415	419	454	488	532	558	715	532	668	500	468	459
10	417	430	443	483	544	560	725	522	691	620	462	456
11	410	410	453	475	543	536	715	520	692	574	452	452
12	405	410	466	469	538	500	719	530	678	541	450	465
13	403	413	460	498	541	468	712	542	650	554	468	468
14	407	411	454	482	549	457	710	510	665	565	481	473
15	410	418	463	482	542	463	710	513	641	569	480	480
16	412	442	463	487	533	494	725	528	591	562	475	480
17	430	439	460	504	499	548	700	520	601	527	472	487
18	418	422	463	520	514	621	659	500	661	505	470	490
19	412	422	463	514	500	562	650	507	552	501	463	483
20	410	420	483	486	482	552	675	510	519	506	457	488
21	412	423	483	483	553	552	650	502	499	502	374	486
22	412	432	477	428	730	563	622	471	510	491	400	461
23	413	418	473	474	513	580	595	510	530	485	411	460
24	413	425	474	490	552	579	582	500	525	470	430	410
25	422	420	474	508	560	593	591	488	502	464	442	432
26	418	427	467	512	532	635	580	525	493	441	460	472
27	417	425	463	531	527	663	582	497	480	457	469	500
28	424	428	465	531	590	683	596	491	477	481	461	510
29	427	434	470	505	---	708	600	490	480	482	460	497
30	425	434	463	518	---	694	610	493	470	482	457	497
31	425	---	473	544	---	680	---	497	---	482	447	---
MONTH	437	419	460	490	537	572	674	524	605	502	462	458

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT AT 0800)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.0	6.0	1.5	1.5	1.5	1.5	8.0	12.0	19.0	21.5	22.0	22.0
2	13.0	6.0	1.5	1.5	1.5	1.5	8.0	12.0	19.5	22.0	22.0	23.0
3	13.0	5.5	1.5	1.5	1.5	1.5	8.0	12.0	18.5	22.0	23.0	23.5
4	13.5	6.0	1.5	1.5	1.5	1.5	8.0	12.0	19.5	21.5	23.0	23.0
5	14.0	6.0	1.5	1.5	1.5	1.5	8.5	13.0	19.5	23.5	23.5	22.0
6	13.0	5.5	1.5	1.5	1.5	1.5	8.5	13.0	19.5	24.5	24.0	21.5
7	13.5	5.5	1.5	1.5	1.5	1.5	8.5	13.5	19.5	24.0	24.0	21.0
8	13.0	5.5	1.5	1.5	1.5	1.5	8.5	14.0	19.5	24.5	24.0	21.5
9	13.0	5.0	1.5	1.5	1.5	1.5	6.5	15.0	20.0	24.5	24.0	20.0
10	13.0	5.0	1.5	1.5	1.5	1.5	7.0	15.0	21.0	25.5	23.5	20.5
11	13.0	5.5	1.5	1.5	1.5	1.5	7.0	14.5	22.0	26.0	23.5	20.0
12	12.0	5.0	1.5	1.5	1.5	1.5	7.0	15.0	21.5	26.0	24.0	20.0
13	12.0	4.0	1.5	1.5	1.5	1.5	8.0	15.0	22.0	26.0	23.5	20.0
14	13.0	3.5	1.5	1.5	1.5	1.5	8.5	14.0	22.0	25.5	23.5	19.5
15	11.5	3.5	1.5	1.5	1.5	1.5	8.5	14.5	23.5	25.5	24.0	18.0
16	11.5	3.0	1.5	1.5	1.5	1.5	9.0	15.0	23.0	24.0	24.0	16.5
17	9.5	3.0	1.5	1.5	1.5	1.5	9.5	15.0	23.5	24.5	24.5	16.0
18	8.0	3.0	1.5	1.5	1.5	1.5	10.0	15.0	24.0	24.0	25.0	15.5
19	6.5	3.0	1.5	1.5	1.5	1.5	11.5	16.0	23.0	24.0	24.0	15.5
20	6.5	3.0	1.5	1.5	1.5	1.5	12.0	17.0	22.0	24.0	25.5	15.0
21	6.5	3.0	1.5	1.5	1.5	1.5	12.0	18.0	21.0	24.5	23.0	14.5
22	6.5	2.0	1.5	1.5	1.5	1.5	12.0	18.0	21.0	24.5	23.0	15.0
23	6.0	2.0	1.5	1.5	1.5	1.5	12.0	19.0	20.5	23.5	23.0	15.0
24	5.5	2.0	1.5	1.5	1.5	1.5	12.0	18.5	21.5	23.5	23.0	13.5
25	5.5	2.0	1.5	1.5	1.5	1.5	12.0	17.0	23.0	24.0	22.0	14.0
26	6.0	2.0	1.5	1.5	1.5	4.0	12.0	18.0	23.0	23.5	22.0	14.5
27	8.0	2.0	1.5	1.5	1.5	4.5	12.0	18.0	22.0	23.5	23.5	14.5
28	6.5	2.0	1.5	1.5	1.5	5.0	12.0	18.0	21.5	23.0	24.5	14.5
29	6.5	2.0	1.5	1.5	---	7.0	12.0	18.5	21.0	23.0	24.0	14.5
30	6.0	1.5	1.5	1.5	---	7.0	12.0	19.5	21.0	22.0	24.5	14.5
31	6.0	---	1.5	1.5	---	6.5	---	19.5	---	21.5	25.0	---
MONTH	10.0	4.0	1.5	1.5	1.5	2.5	9.5	15.5	21.5	24.0	23.5	18.0

## RED RIVER OF THE NORTH BASIN

05054020 RED RIVER OF THE NORTH BELOW FARGO, N. DAK.  
(National stream-quality accounting network station)

LOCATION.--Lat 46°55'50", long 96°47'05", in SW¼NE¼ sec.19, T.140 N., R.48 W., Cass County, at bridge on county highway 2 mi (3.2 km) north of North Dakota State University campus in Fargo, and 12 mi (19 km) above mouth of Sheyenne River.

DRAINAGE AREA.--6,820 mi<sup>2</sup> (17,660 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: July 1969 to current year.

REMARKS.--Records of discharge are given for station 05054000 Red River of the North at Fargo, N. Dak., and are unadjusted for treated sewage inflow between sites.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
NOV.												
01...	1130	454	--	--	--	--	--	39	29	--	--	244
28...	1600	334	--	--	--	--	--	40	30	--	--	258
JAN.												
09...	1400	430	--	--	--	--	--	43	33	16	--	291
MAR.												
07...	1500	500	--	--	--	--	--	48	33	--	--	281
16...	1130	2020	13	--	--	--	--	48	27	19	7.2	194
APR.												
05...	0830	800	--	--	--	--	--	57	38	24	--	199
MAY												
03...	1030	306	--	--	--	--	--	49	34	--	--	271
18...	1000	316	3.9	1600	20	240	20	46	32	20	5.6	263
31...	0930	461	--	--	--	--	--	44	31	--	--	256
JUNE												
20...	1100	210	10	--	--	--	--	48	33	24	6.1	270
26...	1430	161	--	--	--	--	--	48	34	22	--	269
JULY												
25...	1100	101	14	--	--	--	--	45	32	22	5.3	258
SEP.												
12...	1000	70	6.4	--	--	--	--	44	36	28	5.9	253

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L)
NOV.												
01...	0	200	32	7.8	--	--	.11	.29	--	--	.42	.37
28...	0	212	35	8.1	--	--	.22	.89	--	--	.76	.56
JAN.												
09...	0	239	37	9.8	.4	--	.51	1.3	--	--	.86	.63
MAR.												
07...	0	230	71	14	--	--	.55	.69	--	--	.52	.37
16...	0	159	92	11	.3	4.6	--	--	2.3	6.9	.52	--
APR.												
05...	15	188	150	10	.2	--	.06	.20	--	--	.31	.11
MAY												
03...	0	222	83	12	--	--	.06	.60	--	--	.58	.36
18...	0	216	70	10	.3	.12	--	--	1.6	1.7	.51	--
31...	0	210	61	9.9	--	--	.04	.23	--	--	.47	.29
JUNE												
20...	0	221	83	12	.4	.37	--	--	2.2	2.6	.91	--
26...	0	221	72	13	.4	--	.50	.92	--	--	1.0	.78
JULY												
25...	0	212	63	14	.4	.65	--	--	2.9	3.5	1.4	--
SEP.												
12...	0	208	93	17	.3	1.2	--	--	3.7	4.9	1.9	--

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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)
NOV.												
01...	300	.41	368	220	17	--	--	450	8.5	3.5	.0	--
28...	310	.42	280	220	12	--	--	465	8.6	.5	-2.0	--
JAN.												
09...	318	.43	369	240	5	--	.4	480	8.2	.5	-5.0	--
MAR.												
07...	362	.49	489	260	25	--	--	550	8.1	.5	.5	--
16...	368	.50	2010	230	72	15	.5	540	--	.5	5.0	100
APR.												
05...	436	.59	942	300	110	--	.6	620	8.5	7.0	5.0	--
MAY												
03...	388	.53	321	260	40	--	--	560	8.5	11.0	13.5	--
18...	366	.50	312	250	31	15	.6	520	--	15.0	25.0	40
31...	324	.44	403	240	28	--	--	510	8.3	19.0	21.5	--
JUNE												
20...	388	.53	220	260	34	17	.7	550	7.8	20.0	17.5	50
26...	362	.49	157	260	39	--	.6	580	7.9	22.0	23.5	--
JULY												
25...	347	.47	94.6	240	33	16	.6	--	8.2	23.0	24.0	40
SEP.												
12...	371	.50	70.1	260	51	19	.8	600	8.1	17.0	14.5	20



05054020 RED RIVER OF THE NORTH BELOW FARGO, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREP- TOCOCCI (COL- ONIES PER 100 ML)	TOTAL ORGANIC CARBON (C) (MG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)
NOV.												
01...	12.4	99	4.3	280	B10	--	--	--	--	--	--	--
28...	14.0	100	6.8	85	<4	--	--	--	--	--	--	--
JAN.												
09...	9.2	--	8.4	57	B33	--	--	--	--	--	--	--
MAR.												
07...	12.0	85	5.0	2700	B170	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
APR.												
05...	10.6	90	5.9	770	B33	--	--	--	--	--	--	--
MAY												
03...	10.0	93	7.2	B4200	B10	--	--	--	--	--	--	--
18...	8.4	85	--	>15000	B20	B33	16	3	2	0	1	0
31...	7.2	80	5.7	7500	230	--	--	--	--	--	--	--
JUNE												
20...	5.6	63	--	B8000	B6500	B560	--	--	--	--	--	--
26...	6.2	73	7.6	3200	B120	--	--	--	--	--	--	--
JULY												
25...	--	--	8.1	54000	B570	B170	--	--	--	--	--	--
SEP.												
12...	5.8	62	10	12000	1200	200	--	--	--	--	--	--

DATE	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)
NOV.												
01...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
JAN.												
09...	--	--	--	--	--	--	--	--	--	--	--	--
MAR.												
07...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
APR.												
05...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
03...	--	--	--	--	--	--	--	--	--	--	--	--
18...	0	<20	1	10	10	<100	3	.2	.0	5	5	40
31...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
20...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
25...	--	--	--	--	--	--	--	--	--	--	--	--
SEP.												
12...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	DIS- SOLVED ZINC (ZN) (UG/L)	SUS- PEN- DED SEDI- MENT (MG/L)	SUS- PEN- DED SEDI- MENT DIS- CHARGE (T/DAY)	SUS- SED. FALL DIAM. % FINER THAN .062 MM
MAR.				
16...	--	326	1780	--
MAY				
18...	10	106	90	--
JUNE				
20...	--	178	101	--
JULY				
25...	--	98	27	96
SEP.				
12...	--	51	9.6	97

B - Results based on colony count outside the acceptable range.

## RED RIVER OF THE NORTH BASIN

05054020 RED RIVER OF THE NORTH BELOW FARGO, N. DAK.--Continued

BIOLOGICAL ANALYSES AND DISSOLVED OXYGEN PROFILE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

## TWENTY-FOUR HOUR DISSOLVED OXYGEN PROFILE

<u>HR</u>	<u>MG/L</u>	<u>HR</u>	<u>MG/L</u>	<u>HR</u>	<u>MG/L</u>	<u>HR</u>	<u>MG/L</u>
May 17, 1973		2300	8.0	0500	8.0	1200	8.4
1700	8.3	2400	7.9	0600	8.2	1300	8.4
1800	8.3	May 18, 1973		0700	8.3	1400	8.4
1900	8.3	0100	7.8	0800	8.4	1500	8.4
2000	8.3	0200	7.8	0900	8.4	1600	8.5
2100	8.2	0300	7.8	1000	8.4	1700	8.6
2200	8.1	0400	7.9	1100	8.4	1800	8.6

## PHYTOPLANKTON

<u>DATE</u>	<u>TOTAL COUNT CELLS/ML</u>	<u>PERCENT COMPOSITION</u>	<u>3-CODOMINANT GENERA</u>	<u>ALGAL GROUP</u>
730313	3,300	25 16	<u>Cyclotella</u> <u>Melosira</u>	Diatom Diatom
730620	180	53 19	<u>Melosira</u> <u>Cyclotella</u>	Diatom Diatom
730725	130	75	<u>Melosira</u>	Diatom
730912	1,400	88	<u>Oscillatoria</u>	Blue-green

## PERIPHYTON

Collected by plastic strip sampler, placed approximately one month prior to collection date at a point in the stream approximately 150 ft (46 m) downstream from bridge and 10 ft (3 m) from left edge of water.

## BIOMASS

<u>DATE</u>	<u>DRY WEIGHT G/M<sup>2</sup></u>	<u>ASH WEIGHT G/M<sup>2</sup></u>	<u>3-CODOMINANT GENERA</u>	<u>ALGAL GROUP</u>
730620	14.5	2.9	<u>Navicula</u>	Diatom

## BENTHIC INVERTEBRATES

Collected by multi-plate sampler, placed approximately one month prior to collection date at a point in the stream approximately 150 ft (46 m) downstream from bridge and 10 ft (3 m) from left edge of water.

<u>DATE</u>	<u>BIOMASS G/M<sup>2</sup></u>	<u>IDENTIFICATION AND COUNT</u>	<u>COMMON NAME</u>
730620	0.1	Ephemeroptera - 2 Diptera (Chironomidae) - 1 Pelecypoda - 5 Nematode - 1	Mayflies (Insect) Flies and midges (Insect) Clams (Mollusk) Roundworm

## RED RIVER OF THE NORTH BASIN

35

05054500 SHEYENNE RIVER ABOVE HARVEY, N. DAK.

LOCATION.--Lat 47°42'10", long 99°56'55", in SW¼SE¼ sec.24, T.149 N., R.73 W., Wells County, at gaging station on right bank just downstream from county highway, 2 mi (3.2 km) upstream from unnamed tributary and 4.5 mi (7.2 km) south of Harvey.

DRAINAGE AREA.--424 mi<sup>2</sup> (1,098 km<sup>2</sup>), of which about 270 mi<sup>2</sup> (700 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analysis: October 1972 to September 1973 (discontinued).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
NOV.										
06...	1500	5.3	27	640	240	43	40	290	5.9	742
29...	1415	1.3	34	140	100	45	30	270	4.9	701
JAN.										
18...	1300	3.0	20	300	240	15	8.4	120	8.6	296
FEB.										
27...	1700	14	29	320	120	24	12	220	11	518
MAR.										
15...	1440	3.9	20	320	100	29	17	120	11	348
APR.										
30...	1320	4.1	20	20	80	41	33	300	6.6	665
JUNE										
01...	0915	1.1	28	340	80	29	30	300	5.6	636
JULY										
03...	1600	.86	24	910	40	28	17	300	5.3	584
26...	1600	.66	22	1000	40	31	15	240	6.3	567
SEP.										
06...	1500	1.1	34	860	170	51	3.2	320	8.4	729

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITAS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
NOV.										
06...	0	609	270	21	.3	.23	.14	1040	1.42	14.9
29...	0	575	240	17	.3	.23	.07	977	1.33	3.43
JAN.										
18...	0	243	97	9.9	.2	1.1	.55	486	.66	3.94
FEB.										
27...	0	425	150	21	.4	.32	.52	731	.99	27.6
MAR.										
15...	0	285	110	9.7	.1	.36	.22	466	.63	4.91
APR.										
30...	15	570	250	21	.3	.23	.16	1050	1.43	11.6
JUNE										
01...	37	583	220	16	.4	.56	.49	983	1.34	2.92
JULY										
03...	47	557	220	13	.3	.23	.24	967	1.32	2.25
26...	15	490	160	15	.4	.23	.15	805	1.09	1.43
SEP.										
06...	0	598	210	22	.6	.99	.36	1020	1.39	3.03

DATE	HARD- NESS (CA, MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (R) (UG/L)
NOV.									
06...	270	0	69	7.7	1490	7.8	2.5	19	990
29...	240	0	71	7.7	1520	8.2	.0	7.1	860
JAN.									
18...	72	0	76	6.2	686	7.6	.0	12	0
FEB.									
27...	110	0	80	9.2	1110	7.6	.5	21	170
MAR.									
15...	140	0	63	4.4	770	7.5	.0	18	340
APR.									
30...	240	0	73	8.5	1560	8.4	11.0	4.4	530
JUNE									
01...	200	0	76	9.3	1450	8.7	16.0	2.3	500
JULY									
03...	140	0	82	11	1420	8.9	15.0	1.4	860
26...	140	0	78	8.9	1220	8.4	25.5	3.8	780
SEP.									
06...	140	0	82	12	1530	7.7	22.5	23	900

## RED RIVER OF THE NORTH BASIN

05056000 SHEYENNE RIVER NEAR WARWICK, N. DAK.  
(Irrigation network station)

LOCATION.--Lat 47°48'20", long 98°42'57", on south quarter of line between secs.15 and 16, T.150 N., R.63 W., Eddy County, at gaging station on left bank on downstream side of county highway bridge, 3.3 mi (5.3 km) south of Warwick.

DRAINAGE AREA.--2,070 mi<sup>2</sup> (5,360 km<sup>2</sup>), approximately, of which about 1,310 mi<sup>2</sup> (3,390 km<sup>2</sup>) is probably noncontributing - includes 227 mi<sup>2</sup> (588 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--Chemical analyses: January 1951 to current year.

Specific conductance: January 1951 to current year.

Water temperatures: January 1951 to September 1962, October 1963 to September 1964, October 1965 to current year.

## EXTREMES.--Current year:

Dissolved solids: Maximum, 660 mg/l Oct. 1-31; minimum, unknown.

Hardness: Maximum, 290 mg/l Feb. 1-28; minimum, 170 mg/l Mar. 1-31, Apr. 1-30, Aug. 1-31, Sept. 1-30.

Specific conductance: Maximum daily, 1,420 micromhos Mar. 3; minimum daily, 413 micromhos Sept. 26.

Water temperatures: Maximum daily, 25.0°C Aug. 1-2; minimum daily, freezing point on many days during winter months.

## Period of record:

Dissolved solids: Maximum, 1,230 mg/l Mar. 21-23, 1955; minimum, 150 mg/l Apr. 5-9, 1960.

Hardness: Maximum, 572 mg/l Mar. 20, 1959; minimum, 71 mg/l Apr. 5-9, 1960.

Specific conductance: Maximum daily, 1,940 micromhos Feb. 1, 1955; minimum daily, 182 micromhos Apr. 11, 1969.

Water temperatures (1951-55, 1956-62, 1963-64, 1965-73): Maximum daily, 30.0°C July 21, 1955, July 10, 1970; minimum daily, freezing point on many days during winter months.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during the year: Dissolved solids, 952 mg/l Feb. 27; hardness, 420 mg/l Feb. 27. Minimum observed during the year: Dissolved solids, 291 mg/l Aug. 29; hardness, 140 mg/l Mar. 30.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	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 (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.									
01-31	3.8	40	36	110	4.1	430	0	353	660
NOV.									
01-30	8.8	53	30	78	7.6	410	0	336	494
DEC.									
01-31	3.4	61	25	44	3.8	343	0	281	430
JAN.									
01-31	2.4	66	26	53	4.6	373	0	306	454
FEB.									
01-28	1.9	69	28	66	4.7	397	0	326	487
MAR.									
01-31	73	34	20	68	10	265	0	217	425
APR.									
01-30	26	35	20	81	7.4	294	0	241	405
MAY									
01-31	20	49	28	85	7.7	391	0	321	521
JULY									
01-31	1.1	42	30	81	7.3	255	60	309	473
AUG.									
01-31	1.1	37	20	32	3.6	238	0	195	--
SEP.									
01-30	2.6	34	20	31	3.9	219	3	185	--
WTD. AVG.	--	39	23	73	8.4	305	1	251	448
TIME WTD.									
AVG.	13	47	26	66	5.9	328	6	279	483
TONS									
PER DAY	--	1.3	.7	2.4	.3	10	0	8.2	--

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT.								
01-31	.90	6.77	250	0	49	3.0	882	8.0
NOV.								
01-30	.67	11.7	260	0	39	2.1	768	8.0
DEC.								
01-31	.58	3.95	260	0	27	1.2	660	8.2
JAN.								
01-31	.62	2.94	270	0	29	1.4	705	8.2
FEB.								
01-28	.66	2.50	290	0	33	1.7	756	8.1
MAR.								
01-31	.58	83.8	170	0	45	2.3	626	7.4
APR.								
01-30	.55	28.4	170	0	50	2.7	642	7.1
MAY								
01-31	.71	28.1	240	0	43	2.4	809	8.2
JULY								
01-31	.64	1.40	230	0	43	2.3	726	8.5
AUG.								
01-31	--	--	170	0	28	1.1	466	8.2
SEP.								
01-30	--	--	170	0	28	1.0	448	8.5
WTD. AVG.	.61	--	193	0	--	2.3	670	7.6
TIME WTD.								
AVG.	.66	--	225	0	38	1.9	681	8.0
TONS								
PER DAY	--	--	--	--	--	--	--	--



05056000 SHEYENNE RIVER NEAR WARWICK, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)
OCT. 03...	1645	2.7	9.9	0	30	30	24	31	100	7.7	264	41
NOV. 01...	1415	7.7	--	--	--	--	50	28	69	5.6	350	10
28...	1030	9.5	--	--	--	--	58	31	76	6.8	396	0
JAN. 17...	1230	2.3	--	--	--	--	63	19	22	2.4	288	0
FEB. 27...	1115	2.2	--	--	--	--	83	51	180	9.9	753	0
MAR. 20...	1700	86	11	10	100	30	28	16	69	9.7	245	0
MAY 09...	1300	26	--	--	--	--	49	26	90	7.8	375	0
29...	1350	15	--	--	--	--	47	31	100	7.8	400	11
JUNE 29...	1200	2.8	--	--	--	--	45	32	81	8.4	387	0
JULY 24...	1515	.15	--	--	--	--	35	24	49	4.8	252	16
AUG. 29...	1500	.24	6.9	0	0	30	34	20	32	3.7	215	7

DATE	ALKALINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED VED-PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	PERCENT SODIUM
OCT. 03...	285	120	12	.3	.16	.07	508	.69	3.70	190	0	52
NOV. 01...	304	85	11	--	.03	.09	464	.63	9.65	240	0	38
28...	325	85	14	--	.02	.08	506	.69	13.0	270	0	37
JAN. 17...	236	46	4.9	--	.11	.04	326	.44	2.02	240	0	17
FEB. 27...	618	180	26	--	.35	.21	952	1.29	5.65	420	0	48
MAR. 20...	201	81	10	.3	.23	.21	366	.50	85.0	140	0	50
MAY 09...	308	94	15	--	.04	.08	503	.68	35.3	230	0	45
29...	346	110	17	--	.00	.12	546	.74	22.1	250	0	46
JUNE 29...	317	73	15	--	.10	.27	500	.68	3.78	240	0	41
JULY 24...	233	60	9.5	--	.05	.07	350	.48	.14	190	0	36
AUG. 29...	188	51	4.7	.9	.04	.05	291	.40	.19	170	0	29

DATE	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHMS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	CYANIDE (CN) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BERYLLIUM (BE) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)
OCT. 03...	3.2	825	8.5	13.5	20	--	2	0	0	150	1	0
NOV. 01...	1.9	707	8.4	3.0	--	--	--	--	--	--	--	--
28...	2.0	758	7.9	1.5	--	--	--	--	--	--	--	--
JAN. 17...	.6	510	7.9	2.0	--	--	--	--	--	--	--	--
FEB. 27...	3.8	1420	7.6	2.0	--	--	--	--	--	--	--	--
MAR. 20...	2.6	567	7.6	.5	60	.00	4	0	0	220	1	0
MAY 09...	2.6	765	8.1	14.5	--	--	--	--	--	--	--	--
29...	2.8	852	8.4	17.5	--	--	--	--	--	--	--	--
JUNE 29...	2.3	744	7.8	19.0	--	--	--	--	--	--	--	--
JULY 24...	1.6	554	8.4	23.0	--	--	--	--	--	--	--	--
AUG. 29...	1.1	436	8.4	25.0	6	.00	7	0	0	90	1	0

DATE	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT. 03...	2	10	3	60	2.0	1	9	12	4	180	2.5	10
MAR. 20...	0	10	1	50	.4	1	12	23	0	140	.5	40
AUG. 29...	0	6	11	20	6.5	1	2	7	0	10	.5	30

## RED RIVER OF THE NORTH BASIN

05056000 SHEYENNE RIVER NEAR WARWICK, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

(ONCE-DAILY MEASUREMENT)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	890	880	607	690	597	634	612	736	852	790	520	442
2	898	865	628	685	597	633	610	722	855	750	517	445
3	873	782	653	532	737	1420	623	735	832	738	508	448
4	915	845	652	601	712	1300	628	727	848	727	503	448
5	895	823	661	658	761	890	660	732	852	733	500	447
6	853	837	658	809	1070	1060	668	732	852	748	498	444
7	885	833	665	830	592	740	695	740	855	724	495	448
8	933	828	675	843	752	645	670	770	842	767	493	444
9	835	827	670	789	821	598	669	767	847	720	487	437
10	913	800	683	862	766	688	721	765	852	723	486	442
11	923	813	685	803	973	770	704	775	837	706	479	440
12	850	792	667	736	768	905	720	791	840	671	475	433
13	898	777	637	663	1070	855	722	809	829	656	473	437
14	890	757	595	639	885	664	708	819	812	630	470	440
15	895	737	557	702	934	542	720	813	810	681	470	445
16	893	734	562	681	834	464	732	822	740	660	466	442
17	945	734	530	715	771	436	732	820	752	605	465	439
18	761	704	540	707	869	455	740	830	722	579	465	432
19	862	718	517	810	873	494	752	831	740	587	463	437
20	845	758	517	713	848	545	760	835	760	577	462	437
21	920	748	530	739	850	572	760	796	793	580	453	440
22	993	587	519	569	851	583	735	813	822	560	449	440
23	903	758	496	703	681	583	809	813	822	565	449	443
24	835	576	568	663	614	574	815	825	805	560	447	437
25	863	737	628	739	739	548	795	830	802	539	450	418
26	863	743	647	838	668	527	818	850	795	527	440	413
27	887	456	514	723	685	508	830	850	785	512	445	418
28	868	748	560	772	589	506	822	855	782	530	445	440
29	870	635	685	631	---	506	835	841	781	527	447	462
30	875	600	567	658	---	512	825	832	795	517	450	502
31	853	---	620	602	---	522	---	835	---	520	450	---
MONTH	883	748	603	713	782	667	730	797	810	636	472	441

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

(ONCE-DAILY MEASUREMENT)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	3.0	1.0	1.0	1.0	6.0	2.0	9.0	20.0	22.0	25.0	21.0
2	---	3.0	1.0	2.0	2.0	4.0	4.0	9.0	22.0	18.0	25.0	20.0
3	---	3.0	0.0	1.0	2.0	6.0	5.0	11.0	19.0	19.0	21.0	18.0
4	---	3.0	1.0	0.0	1.0	6.0	7.0	13.0	20.0	22.0	22.0	17.0
5	---	3.0	1.0	0.0	2.0	6.0	8.0	14.0	20.0	20.0	21.0	16.0
6	---	2.0	1.0	1.0	1.0	2.0	5.0	16.0	18.0	22.0	21.0	18.0
7	---	2.0	1.0	1.0	1.0	1.0	4.0	15.0	16.0	22.0	22.0	16.0
8	---	2.0	0.5	1.0	2.0	1.0	5.0	14.0	18.0	24.0	22.0	17.0
9	---	2.0	1.0	1.0	1.0	1.0	5.0	13.0	20.0	23.0	19.0	20.0
10	---	2.0	1.0	1.0	2.0	2.0	5.0	11.0	21.0	22.0	19.0	18.0
11	---	1.0	1.0	1.0	2.0	2.0	6.0	11.0	19.0	24.0	20.0	18.0
12	---	1.0	2.0	1.0	2.0	2.0	6.0	12.0	18.0	22.0	20.0	23.0
13	---	0.0	1.0	2.0	1.0	3.0	6.0	10.0	20.0	20.0	20.0	15.0
14	---	1.0	1.0	2.0	1.0	1.0	9.0	12.0	21.0	19.0	21.0	24.0
15	---	2.0	1.0	2.0	1.0	1.0	9.0	15.0	23.0	24.0	20.0	11.0
16	---	2.0	0.0	2.0	1.0	2.0	9.0	12.0	22.0	20.0	21.0	9.0
17	---	2.0	1.0	2.0	2.0	1.0	12.0	14.0	21.0	21.0	22.0	10.0
18	---	2.0	1.0	2.0	2.0	2.0	10.0	14.0	19.0	21.0	22.0	11.0
19	---	2.0	1.0	1.0	2.0	1.0	14.0	19.0	17.0	19.0	21.0	10.0
20	---	2.0	1.0	1.0	1.0	1.0	12.0	20.0	16.0	19.0	19.0	9.0
21	---	2.0	1.0	2.0	1.0	2.0	10.0	16.0	16.0	20.0	17.0	9.0
22	---	2.0	4.0	1.0	2.0	2.0	7.0	17.0	19.0	21.0	20.0	8.0
23	---	2.0	1.0	2.0	2.0	3.0	8.0	16.0	20.0	21.0	19.0	9.0
24	---	2.0	1.0	3.0	1.0	2.0	9.0	16.0	20.0	20.0	20.0	10.0
25	---	2.0	1.0	2.0	4.0	3.0	9.0	15.0	20.0	20.0	19.0	11.0
26	---	2.0	2.0	3.0	2.0	2.0	6.0	15.0	20.0	21.0	23.0	12.0
27	---	0.0	4.0	2.0	2.0	2.0	9.0	17.0	19.0	19.0	22.0	15.0
28	---	1.0	2.0	1.0	2.0	1.0	9.0	19.0	18.0	20.0	22.0	16.0
29	---	2.0	1.0	1.0	---	2.0	8.0	20.0	18.0	20.0	21.0	13.0
30	---	1.0	1.0	1.0	---	1.0	9.0	20.0	19.0	20.0	21.0	16.0
31	---	---	1.0	1.0	---	2.0	---	19.0	---	22.0	22.0	---
MONTH	---	2.0	1.0	1.5	1.5	2.5	7.5	14.5	19.5	21.0	21.0	14.5

**LOCATION.**--Lat 48°10'40", long 99°13'15", in NW¼NW¼ sec.12, T.154 N., R.67 W., Benson County, at gaging station at bridge on U.S. Highway 281, 0.7 mi (1.1 km) downstream from Little Coulee, and 6 mi (10 km) south of Churchs Ferry.

**PERIOD OF RECORD.**--Chemical analyses: June 1954 to current year.

REMARKS.--No flow Dec. 13 to Mar. 1 and June 26 to Sept. 30.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM- INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED CIUM (CA) (MG/L)	DIS-SOLVED MAG- NE- SIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HC03) (MG/L)	CAR- BONATE (C03) (MG/L)
OCT.												
04...	1700	.07	.4	0	40	10	45	47	110	22	246	21
NOV.												
02...	1330	5.1	7.1	--	--	--	69	60	100	28	413	8
29...	1130	19	12	--	--	--	81	67	110	33	480	0
MAR.												
22...	1300	2.7	13	0	80	1100	58	30	62	15	253	0
MAY												
09...	0840	8.4	2.8	--	--	--	55	41	70	19	311	0
30...	1330	1.5	3.5	--	--	--	44	52	110	13	224	44

DATE	ALKALINITY AS CAC03 (MG/L)	DIS- SOLVED SULFATE (S04) (MG/L)	DIS- SOLVED CHLORIDE (CL) (MG/L)	DIS- SOLVED FLUORIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED VED- PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)
OCT. 04...	237	270	40	.4	.00	.05	728	.99	.14	310	69
NOV. 02...	352	280	42	.5	.68	.08	864	1.18	11.9	420	67
29...	394	260	44	.4	.68	.05	932	1.27	47.8	480	84
MAR. 22...	208	190	24	.2	.30	.16	523	.71	3.81	270	61
MAY 09...	255	180	30	.3	.27	.11	612	.83	13.9	310	51
30...	257	260	41	.4	.13	.16	732	1.00	2.96	320	67

DATE	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)
OCT. 04...	42	2.7	1027	8.6	14.0	50	0	0	250	1	0
NOV. 02...	32	2.1	1220	8.4	1.0	60	--	--	160	--	--
29...	32	2.2	1280	8.0	.0	40	--	--	170	--	--
MAR. 22...	32	1.6	794	7.6	.0	30	4	0	100	1	0
MAY 09...	32	1.7	883	8.1	12.5	40	--	--	130	--	--
30...	41	2.7	1060	9.1	24.0	40	--	--	180	--	--

[illegible]

## RED RIVER OF THE NORTH BASIN

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, N. DAK.

LOCATION.--Lat 47°26'01", long 98°01'43", in NE¼NE¼SE¼ sec.27, T.146 N., R.58 W., Griggs County, at gaging station at county bridge, 5 mi (8 km) east of Cooperstown.

DRAINAGE AREA.--6,470 mi<sup>2</sup> (16,760 km<sup>2</sup>), approximately, of which 5,200 mi<sup>2</sup> (13,500 km<sup>2</sup>) is probably noncontributing - includes 3,800 mi<sup>2</sup> (9,800 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD: Chemical analyses: October 1959 to September 1960, October 1966 to current year.

Specific conductance: October 1966 to current year.

Water temperatures: October 1966 to current year.

## EXTREMES.--Current year:

Dissolved solids: Maximum, 744 mg/l Dec. 1-31; minimum observed, 353 mg/l Mar. 1-31.

Hardness: Maximum, 400 mg/l Dec. 1-31, Jan. 1-31, Feb. 1-28; minimum, 170 mg/l Mar. 1-31.

Specific conductance: Maximum daily, 1,150 micromhos Feb. 16; minimum daily, 455 micromhos Mar. 23.

Water temperatures: Maximum daily, 28.0°C Aug. 16-17; minimum daily, freezing point on many days during winter months.

Period of record: 1966 to current year.

Dissolved solids: Maximum, 1,250 mg/l Mar. 15-18, 1967; minimum, 208 mg/l Mar. 24-25, 1967.

Hardness: Maximum, 681 mg/l Mar. 15-18, 1967; minimum, 102 mg/l Mar. 24-25, 1967.

Specific conductance: Maximum daily, 2,170 micromhos Mar. 18, 1967; minimum daily, 255 micromhos Apr. 9, 1971.

Water temperatures: Maximum daily, 28.0°C Aug. 16-17, 1973; minimum daily, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Minimum observed during the year: Hardness 160 mg/l Apr. 3.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.									
01-31	15	72	31	74	7.6	380	0	312	576
NOV.									
01-30	21	72	32	80	7.1	412	0	338	592
DEC.									
01-31	18	89	42	100	6.7	528	0	433	744
JAN.									
01-31	12	96	40	93	7.8	515	0	422	722
FEB.									
01-28	8.8	97	39	95	8.0	527	0	432	717
MAR.									
01-31	143	38	18	51	8.7	220	0	180	353
APR.									
01-30	74	47	22	62	7.6	293	0	240	435
MAY									
01-31	48	65	31	76	7.4	380	0	312	598
JUNE									
01-30	31	56	28	75	8.3	354	0	290	515
JULY									
01-31	6.4	50	22	59	7.7	280	0	230	430
AUG.									
01-31	1.8	59	28	66	8.5	338	0	277	532
SEP.									
01-30	17	53	23	50	9.8	248	0	203	--
WTD. AVG.	--	54	25	65	8.1	312	0	255	476
TIME WTD.									
AVG.	33	66	30	73	7.9	372	0	305	564
TONS									
PER DAY	--	4.8	2.2	5.8	.7	30	0	23	--

DATE	DIS- SOLVED SOLIDS (TONS AC-FT)	DIS- SOLVED SOLIDS (TONS DAY)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT.								
01-31	.78	23.3	310	0	34	1.8	840	7.7
NOV.								
01-30	.81	33.6	310	0	35	2.0	872	8.3
DEC.								
01-31	1.01	36.2	400	0	35	2.2	1100	8.0
JAN.								
01-31	.98	23.4	400	0	33	2.0	1070	8.0
FEB.								
01-28	.98	17.0	400	0	33	2.1	983	7.9
MAR.								
01-31	.48	136	170	0	38	1.7	546	7.7
APR.								
01-30	.59	86.9	210	0	38	1.9	670	7.7
MAY								
01-31	.81	77.5	290	0	36	1.9	860	8.0
JUNE								
01-30	.70	43.1	260	0	38	2.0	785	8.1
JULY								
01-31	.58	7.43	220	0	36	1.8	651	8.1
AUG.								
01-31	.72	2.59	260	0	34	1.8	784	8.2
SEP.								
01-30	--	--	230	24	31	1.4	665	8.0
WTD. AVG.	.65	--	238	1	--	1.8	712	7.8
TIME WTD.								
AVG.	.77	--	288	2	35	1.9	818	8.0
TONS								
PER DAY	--	--	--	--	--	--	--	--



05057000 SHEYENNE RIVER NEAR COOPERSTOWN, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM- INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (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)
OCT.												
04...	1200	12	28	0	20	450	74	30	74	7.9	376	0
NOV.												
07...	1330	22	18	--	--	--	70	29	70	7.0	353	0
DEC.												
01...	1330	20	12	--	--	--	72	33	85	6.7	422	0
FEB.												
06...	1720	8.8	27	--	--	--	93	38	89	7.3	522	0
MAR.												
13...	1415	156	14	--	--	--	39	18	41	11	221	0
APR.												
03...	1445	113	7.8	10	50	90	34	17	61	7.2	233	0
MAY												
02...	1045	51	10	--	--	--	61	27	76	7.5	360	0
JUNE												
06...	1950	29	20	--	--	--	68	33	99	8.5	410	0
JULY												
03...	1145	15	26	--	--	--	45	21	55	7.4	271	0
AUG.												
08...	1535	7.8	29	--	--	--	61	27	60	7.4	330	0
SEP.												
06...	1515	3.3	26	10	20	2200	63	28	65	8.0	329	0

DATE	ALKA-LINITY AS CAC03 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO- RIDE (CL) (MG/L)	DIS-SOLVED FLUO- RIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED PHOS- PHORUS (P) (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)	NON-CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
OCT.												
04...	308	140	16	.3	.08	.22	580	.79	18.8	310	0	34
NOV.												
07...	290	140	17	.3	.10	.12	588	.80	34.9	290	5	33
DEC.												
01...	346	140	17	.4	.06	.05	616	.84	33.3	320	0	36
FEB.												
06...	428	150	18	.3	.29	.15	707	.96	16.8	390	0	33
MAR.												
13...	181	83	11	.3	.54	.35	378	.51	159	170	0	32
APR.												
03...	191	88	11	.2	.05	.07	374	.51	114	160	0	45
MAY												
02...	295	130	14	.3	.13	.07	518	.70	71.3	260	0	38
JUNE												
06...	336	130	19	.6	.12	.18	574	.78	44.9	310	0	41
JULY												
03...	222	91	11	.5	.22	.24	436	.59	17.7	200	0	37
AUG.												
08...	271	120	12	.5	.13	.36	503	.68	10.6	260	0	32
SEP.												
06...	270	130	13	.1	.21	.26	520	.71	4.65	270	3	33

DATE	SODIUM AD- SORP- TION RATIO	SPE-CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/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)
OCT.												
04...	1.8	869	8.0	11.0	20	.00	0	0	0	180	1	0
NOV.												
07...	1.8	816	7.8	.5	20	--	--	--	--	170	--	--
DEC.												
01...	2.1	885	7.5	.0	20	--	--	--	--	140	--	--
FEB.												
06...	2.0	1060	7.5	.0	20	--	--	--	--	180	--	--
MAR.												
13...	1.4	546	7.8	.0	70	--	--	--	--	120	--	--
APR.												
03...	2.1	567	8.0	6.5	50	.00	5	200	0	170	0	0
MAY												
02...	2.0	793	8.3	9.0	20	--	--	--	--	160	--	--
JUNE												
06...	2.5	891	8.0	18.5	30	--	--	--	--	140	--	--
JULY												
03...	1.7	623	8.1	20.0	40	--	--	--	--	160	--	--
AUG.												
08...	1.6	725	8.3	23.0	20	--	--	--	--	170	--	--
SEP.												
06...	1.7	745	8.2	19.0	20	.02	11	0	0	160	0	0

DATE	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB- DENUM (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.												
04...	2	8	3	50	.2	2	18	4	4	280	2.8	10
APR.												
03...	2	31	0	20	.2	1	15	18	0	130	.3	20
SEP.												
06...	0	8	3	60	.9	3	9	6	0	300	1.6	40

## RED RIVER OF THE NORTH BASIN

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	832	813	944	1070	1070	888	612	940	868	618	716	784
2	868	804	1010	1050	1060	865	660	900	868	617	734	784
3	863	803	1010	1080	1060	610	710	860	865	617	740	784
4	840	810	1010	1060	1070	538	720	817	869	640	750	788
5	820	820	1010	1040	1070	515	740	821	872	623	753	780
6	800	830	1010	1070	1070	541	760	819	878	631	757	770
7	853	847	1020	1070	1060	552	785	820	873	640	753	763
8	853	843	1020	1060	1060	600	810	820	878	648	755	767
9	861	849	1020	1060	1060	650	815	819	864	656	760	767
10	867	850	1020	1040	1060	698	783	815	860	623	752	762
11	865	850	1020	1040	1080	592	860	840	865	670	754	772
12	865	850	1040	1050	1100	555	915	839	865	682	760	772
13	867	849	1060	1060	1120	560	875	815	819	689	790	780
14	860	855	1070	1070	1140	640	880	841	872	695	767	777
15	855	875	1070	1080	1110	600	880	852	889	689	765	777
16	865	880	1070	1050	1150	560	890	850	850	662	762	780
17	850	890	1070	1040	1140	520	892	840	855	654	768	770
18	838	900	1070	1060	1100	479	890	841	840	658	752	764
19	872	914	1080	1050	1080	569	885	865	840	662	748	778
20	870	922	1080	1050	1060	540	880	855	660	666	771	770
21	864	915	1080	1040	1060	510	880	850	668	671	775	740
22	863	912	1080	1050	1060	480	882	828	650	656	778	720
23	854	883	1070	1060	1060	455	920	861	642	661	780	740
24	812	877	1080	1070	1060	494	965	881	660	678	781	758
25	780	880	1090	1070	1060	478	960	950	683	695	785	670
26	739	875	1070	1080	1060	510	950	955	744	650	788	668
27	826	877	1080	1080	1060	540	940	950	730	640	792	654
28	836	877	1080	1070	1060	567	980	940	740	673	797	618
29	840	877	1080	1070	---	567	970	930	690	710	793	550
30	850	898	1090	1070	---	560	981	935	641	720	790	565
31	858	---	1090	1070	---	554	---	927	---	731	794	---
MONTH	845	864	1050	1060	1080	574	856	867	797	662	766	739

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	0.5	0.0	0.0	0.0	---	5.0	9.5	22.0	21.0	24.0	20.0
2	12.0	0.5	0.0	0.0	0.0	---	5.0	10.5	22.0	21.0	23.0	20.0
3	11.5	0.5	0.0	0.0	0.0	---	5.5	11.5	21.0	21.5	24.0	20.0
4	11.5	0.5	0.0	0.0	0.0	---	5.5	12.5	21.0	24.0	24.0	19.5
5	11.0	0.5	0.0	0.0	0.0	---	5.0	14.0	19.0	27.0	23.5	19.0
6	11.0	0.5	0.0	0.0	0.0	---	4.5	14.0	19.0	23.0	27.0	19.0
7	10.0	0.5	0.0	0.0	0.0	---	4.0	15.0	18.5	25.0	24.0	19.0
8	9.0	0.5	0.0	0.0	0.0	---	4.0	15.0	19.0	24.0	24.0	22.0
9	9.0	0.5	0.0	0.0	0.0	---	4.0	14.0	21.5	23.0	24.0	20.0
10	11.5	0.5	0.0	0.0	0.0	---	4.0	14.5	22.0	24.0	23.0	19.0
11	10.0	0.5	0.0	0.0	0.0	---	4.0	12.0	20.0	26.0	23.0	20.0
12	9.0	0.5	0.0	0.0	0.0	---	4.5	12.0	21.0	26.0	25.0	19.0
13	7.5	0.5	0.0	0.0	0.0	---	5.5	12.0	22.0	25.0	24.0	19.0
14	6.5	0.5	0.0	0.0	0.0	---	6.0	12.0	22.0	24.0	23.0	18.0
15	6.0	0.5	0.0	0.0	0.0	---	7.0	12.0	23.0	23.5	25.0	14.0
16	5.0	0.5	0.0	0.0	0.0	---	7.5	13.0	22.0	24.0	28.0	13.5
17	4.0	0.5	0.0	0.0	0.0	---	8.0	15.0	20.0	24.0	28.0	14.0
18	4.0	0.5	0.0	0.0	0.0	---	10.0	17.0	20.0	24.0	24.0	14.0
19	4.5	0.5	0.0	0.0	0.0	---	10.0	19.0	19.0	23.0	22.0	14.0
20	3.5	0.5	0.0	0.0	0.0	---	9.0	19.0	18.5	22.0	21.0	15.0
21	3.0	0.5	0.0	0.0	0.0	---	8.0	18.0	19.5	22.0	21.0	15.0
22	4.0	0.5	0.0	0.0	0.0	---	7.5	18.0	20.0	21.0	21.0	16.0
23	4.5	0.5	0.0	0.0	0.0	---	7.0	18.0	21.0	22.0	24.0	16.0
24	4.0	0.5	0.0	0.0	0.0	---	6.5	15.0	21.0	22.0	21.0	16.0
25	4.0	0.5	0.0	0.0	0.0	---	7.0	15.5	20.0	22.0	21.0	16.0
26	4.0	0.0	0.0	0.0	0.0	---	8.0	15.0	20.0	22.0	21.0	16.0
27	3.0	0.0	0.0	0.0	0.0	---	8.5	16.0	20.0	21.0	24.0	14.5
28	2.0	0.0	0.0	0.0	0.0	---	9.0	17.0	21.0	20.0	22.5	14.5
29	2.0	0.0	0.0	0.0	---	---	9.0	18.0	21.0	20.0	23.0	14.5
30	1.5	0.0	0.0	0.0	---	---	8.5	19.0	21.0	21.0	23.0	14.0
31	1.0	---	0.0	0.0	---	---	---	20.0	---	22.0	23.0	---
MONTH	6.5	0.5	0.0	0.0	0.0	---	6.5	15.0	20.5	23.0	23.5	17.0

## 05058700 SHEYENNE RIVER AT LISBON, N. DAK.

LOCATION.--Lat 46°26'49", long 97°40'44", on line between secs.1 and 2, T.134 N., R.56 W., Ransom County, at gaging station, 150 ft (46 m) downstream from dam at State fish hatchery at north edge of city of Lisbon, 3 mi (5 km) upstream from Timber Coulee, and at mile 162.1 (kilometre 260.8).

DRAINAGE AREA.--8,190 mi<sup>2</sup> (21,210 km<sup>2</sup>), approximately, of which about 5,700 mi<sup>2</sup> (14,800 km<sup>2</sup>) is probably noncontributing - includes 3,800 mi<sup>2</sup> (9,800 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--Chemical analyses: August 1956 to current year.

Specific conductance: August 1956 to current year.

Water temperatures: August 1956 to current year.

## EXTREMES.--Current year:

Dissolved solids: Maximum observed, 821 mg/l June 1-30; minimum, 478 mg/l Mar. 1-31.

Hardness: Maximum, 390 mg/l May 1-31, June 1-30; minimum, 250 mg/l Mar. 1-31.

Specific conductance: Maximum daily, 1,280 micromhos June 8; minimum daily, 637 micromhos Mar. 19.

Water temperatures: Maximum daily, 28.0°C Aug. 15; minimum daily, freezing point on many days during winter months.

## Period of record:

Dissolved solids (1956-58, 1959-73): Maximum, 917 mg/l May 22 to June 15, 1964; minimum, 185 mg/l Apr. 3-5, 1960.

Hardness: Maximum, 458 mg/l May 16-31, 1963; minimum, 102 mg/l Apr. 3-5, 1960.

Specific conductance: Maximum daily, 1,450 micromhos Jan. 30, 1962; minimum daily, 243 micromhos Apr. 2, 1960.

Water temperatures: Maximum daily, 32.0°C Aug. 23, 1959; minimum daily, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	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 (HC03) (MG/L)	CAR- BONATE (C03) (MG/L)	ALKA- LINITY AS CAC03 (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.									
01-31	24	71	32	91	11	303	0	249	728
NOV.									
01-30	42	71	32	95	11	321	0	263	652
DEC.									
01-31	48	68	32	86	9.3	347	0	285	652
JAN.									
01-31	54	65	30	87	11	336	0	276	630
FEB.									
01-28	70	67	34	96	10	356	0	292	616
MAR.									
01-31	165	56	26	62	9.7	227	0	186	478
APR.									
01-30	62	63	34	84	9.8	303	0	249	635
MAY									
01-31	27	85	42	110	11	359	0	294	790
JUNE									
01-30	22	86	43	120	13	354	0	290	821
JULY									
01-31	6.1	79	42	120	15	347	0	285	781
AUG.									
01-31	12	69	40	120	14	335	0	275	802
SEP.									
01-30	25	--	--	--	--	309	0	253	--
WTD. AVG.	--	65	32	84	10	301	0	247	611
TIME WTD.									
AVG.	46	71	35	97	11	325	0	266	690
TONS									
PER DAY	--	7.8	3.8	10	1.2	38	0	31	--

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT.								
01-31	.99	47.2	310	60	38	2.3	952	7.5
NOV.								
01-30	.89	73.9	310	46	39	2.4	964	8.2
DEC.								
01-31	.89	84.5	300	17	37	2.2	952	8.0
JAN.								
01-31	.86	91.9	290	10	39	2.2	915	8.0
FEB.								
01-28	.84	116	310	15	40	2.4	961	8.0
MAR.								
01-31	.65	213	250	61	34	1.7	737	7.7
APR.								
01-30	.86	106	300	49	37	2.1	910	7.7
MAY								
01-31	1.07	57.6	390	91	38	2.4	1160	8.0
JUNE								
01-30	1.12	48.8	390	100	39	2.6	1210	8.2
JULY								
01-31	1.06	12.9	370	86	40	2.7	1170	8.1
AUG.								
01-31	1.09	26.0	340	62	42	2.8	1210	8.2
SEP.								
01-30	--	--	--	--	--	--	1000	8.2
WTD. AVG.	.83	--	296	47	--	2.1	911	7.9
TIME WTD.								
AVG.	.94	--	324	55	38	2.3	1010	8.0
TONS								
PER DAY	--	--	--	--	--	--	--	--

## RED RIVER OF THE NORTH BASIN

05058700 SHEYENNE RIVER AT LISBON, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
OCT.												
04...	1645	19	15	--	--	--	66	30	84	10	285	0
NOV.												
08...	1140	26	10	--	--	--	67	31	92	11	300	0
30...	1530	45	9.4	--	--	--	66	31	82	11	315	0
FEB.												
08...	0930	67	22	--	--	--	63	31	87	11	353	0
MAR.												
06...	0930	92	20	--	--	--	62	30	83	13	319	0
APR.												
04...	1130	107	14	20	1100	200	66	30	76	9.0	289	0
MAY												
02...	1600	25	7.9	--	--	--	80	40	100	11	366	0
JUNE												
12...	1425	23	10	--	--	--	84	42	120	12	358	0
JULY												
10...	1500	5.3	16	--	--	--	75	39	120	13	346	0
AUG.												
07...	1330	7.7	18	--	--	--	76	40	120	13	341	0
SEP.												
06...	1600	53	19	10	20	140	59	35	120	12	317	0

DATE	ALKA- LINITAS AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
OCT.												
04...	234	180	42	.4	.01	.05	640	.87	32.8	290	55	38
NOV.												
08...	246	190	49	.4	.04	.09	632	.86	44.4	290	49	39
30...	258	170	32	.4	.00	.12	552	.75	67.1	290	34	37
FEB.												
08...	290	170	32	.4	.93	.35	628	.85	114	280	0	39
MAR.												
06...	262	170	31	.4	1.3	.39	568	.77	141	290	28	38
APR.												
04...	237	180	25	.3	.37	.05	593	.81	171	290	52	36
MAY												
02...	300	260	37	.3	.01	.03	754	1.03	50.9	360	64	37
JUNE												
12...	294	280	62	.4	.03	.05	804	1.09	49.9	380	89	40
JULY												
10...	284	250	61	.7	.02	.13	763	1.04	10.9	350	64	42
AUG.												
07...	280	270	63	.4	.06	.01	816	1.11	17.0	350	75	41
SEP.												
06...	260	220	66	.3	.02	.20	728	.99	104	290	32	46

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/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)
OCT.												
04...	2.2	920	7.8	15.5	20	--	--	--	--	230	--	--
NOV.												
08...	2.3	950	7.8	2.0	20	--	--	--	--	240	--	--
30...	2.1	872	7.8	.0	20	--	--	--	--	200	--	--
FEB.												
08...	2.2	936	7.7	.0	20	--	--	--	--	340	--	--
MAR.												
06...	2.2	904	7.6	.0	50	--	--	--	--	220	--	--
APR.												
04...	1.9	856	8.3	4.5	30	.00	3	0	0	110	0	0
MAY												
02...	2.3	1080	8.2	10.5	20	--	--	--	--	260	--	--
JUNE												
12...	2.7	1210	8.1	23.0	30	--	--	--	--	330	--	--
JULY												
10...	2.8	1130	8.0	26.0	20	--	--	--	--	320	--	--
AUG.												
07...	2.8	1160	7.8	24.5	20	--	--	--	--	340	--	--
SEP.												
06...	3.1	1067	8.2	22.5	20	.00	6	0	0	300	0	0

DATE	DIS- SOLVED COBALT (CO) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
APR.												
04...	2	32	0	50	.2	1	23	3	0	330	.4	10
SEP.												
06...	0	12	5	90	.0	4	21	7	0	420	3.5	10



## RED RIVER OF THE NORTH BASIN

45

05058700 SHEYENNE RIVER AT LISBON, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	904	1010	858	902	935	970	909	1080	1240	1180	1180	1120
2	904	1010	873	928	928	957	919	1100	1220	1190	1220	1120
3	907	1000	883	925	921	964	940	1100	1240	1180	1220	1120
4	903	993	890	918	915	966	970	1110	1250	1180	1210	1110
5	923	979	887	911	917	929	961	1120	1260	1180	1220	1100
6	915	973	859	907	919	881	960	1130	1260	1190	1220	1100
7	945	965	853	907	928	881	968	1140	1270	1170	1230	1140
8	925	963	867	909	943	900	1020	1160	1280	1170	1240	1120
9	930	963	883	910	955	858	1020	1160	1250	1180	1240	1120
10	935	956	903	910	961	822	1010	1160	1240	1180	1250	1070
11	950	960	914	915	966	798	1010	1160	1260	1180	1250	1060
12	947	957	922	918	971	798	1020	1160	1230	1180	1260	1050
13	950	954	925	922	973	758	1040	1180	1240	1190	1270	1050
14	954	954	930	922	973	731	1100	1180	1230	1200	1270	1050
15	942	970	930	922	979	728	1130	1170	1240	1220	1260	1050
16	947	984	938	925	1000	712	1150	1180	1240	1200	1250	1050
17	953	993	940	925	996	687	1180	1180	1240	1200	1270	1080
18	947	1020	947	937	1010	678	1150	1180	1240	1200	1250	1070
19	947	1030	939	935	1020	637	1160	1220	1270	1220	1230	1070
20	947	1010	927	937	1020	670	1170	1180	1260	1220	1230	1070
21	947	963	927	942	1020	662	1180	1180	1250	1220	1240	1040
22	957	940	927	947	1010	694	1210	1170	1250	1220	1230	1040
23	961	960	924	945	1000	672	1190	1170	1230	1210	1240	1000
24	977	970	923	949	987	699	1210	1170	1220	1210	1240	1010
25	987	983	920	941	987	700	1220	1160	1220	1200	1240	1010
26	988	965	915	941	995	694	1220	1160	1220	1210	1220	989
27	1000	967	906	941	1000	694	1220	1180	1220	1220	1200	980
28	1000	927	896	941	995	699	1220	1080	1220	1200	1190	955
29	999	886	887	949	---	747	1230	1090	1220	1180	1170	890
30	988	878	887	950	---	792	1240	1230	1220	1180	1160	820
31	999	---	878	952	---	804	---	1240	---	1180	1150	---
MONTH	951	969	905	928	972	780	1100	1160	1240	1190	1230	1050

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.0	2.5	0.0	0.0	0.0	0.0	2.5	9.0	23.0	20.5	20.5	24.0
2	12.0	2.5	0.0	0.0	0.0	0.0	3.0	9.0	21.0	20.5	20.5	23.5
3	12.0	3.5	0.0	0.0	0.0	0.0	3.5	9.0	21.0	24.5	20.5	23.5
4	12.5	4.0	0.0	0.0	0.0	0.0	4.0	9.0	22.0	26.0	22.5	22.0
5	12.5	4.0	0.0	0.0	0.0	0.0	5.5	9.5	20.5	24.5	24.0	21.5
6	10.0	3.5	0.0	0.0	0.0	0.0	6.0	10.0	22.0	26.0	25.5	22.5
7	12.5	2.0	0.0	0.0	0.0	0.0	5.0	10.5	20.0	27.0	24.0	20.5
8	10.5	2.5	0.0	0.0	0.0	0.0	4.0	11.0	23.5	24.5	22.5	20.5
9	10.0	2.5	0.0	0.0	0.0	0.0	3.0	13.0	21.5	26.5	22.5	20.0
10	11.0	2.0	0.0	0.0	0.0	0.0	3.5	14.0	22.5	25.0	23.5	21.0
11	11.0	2.0	0.0	0.0	0.0	0.0	4.5	15.0	23.0	26.0	23.0	21.0
12	9.5	1.5	0.0	0.0	0.0	0.0	5.0	15.0	23.5	27.0	23.5	20.0
13	10.0	0.0	0.0	0.0	0.0	0.0	5.0	14.5	23.5	25.0	25.5	19.0
14	10.0	0.0	0.0	0.0	0.0	0.0	7.0	12.0	24.5	23.0	24.5	17.5
15	8.5	0.0	0.0	0.0	0.0	0.0	6.0	13.5	26.5	24.0	28.0	15.0
16	8.0	0.0	0.0	0.0	0.0	0.0	5.0	13.5	23.0	26.0	24.5	13.0
17	6.5	0.0	0.0	0.0	0.0	0.0	5.5	13.5	21.5	24.5	25.0	16.5
18	3.5	0.0	0.0	0.0	0.0	0.0	7.0	15.5	22.5	25.0	26.5	17.0
19	3.5	0.5	0.0	0.0	0.0	0.0	8.0	20.0	20.5	23.0	26.0	14.0
20	4.5	0.0	0.0	0.0	0.0	0.0	8.0	17.5	19.5	21.5	23.0	12.5
21	4.5	0.0	0.0	0.0	0.0	0.0	8.5	18.5	18.0	21.0	22.5	12.0
22	5.0	0.0	0.0	0.0	0.0	0.0	8.0	17.5	21.0	21.0	21.0	12.0
23	3.5	0.0	0.0	0.0	0.0	0.0	8.5	17.5	22.5	20.5	20.5	12.0
24	3.5	0.0	0.0	0.0	0.0	0.0	8.0	17.0	21.0	25.0	21.5	13.5
25	4.5	1.0	0.0	0.0	0.0	0.5	8.5	16.0	22.0	24.0	24.5	12.5
26	5.0	1.0	0.0	0.0	0.0	0.0	8.0	16.0	23.0	24.0	22.5	13.5
27	5.0	0.0	0.0	0.0	0.0	1.0	9.0	16.0	23.0	21.5	24.5	12.5
28	4.5	0.0	0.0	0.0	0.0	0.5	9.0	20.0	21.0	21.0	25.0	14.0
29	4.0	0.0	0.0	0.0	---	0.5	9.0	20.0	20.5	23.0	27.0	13.0
30	3.0	0.0	0.0	0.0	---	0.0	9.0	22.5	23.0	23.0	25.0	15.0
31	2.0	---	0.0	0.0	---	2.0	---	23.5	---	20.5	23.0	---
MONTH	7.5	1.0	0.0	0.0	0.0	0.0	6.0	15.0	22.0	23.5	23.5	17.0

05059000 SHEYENNE RIVER NEAR KINDRED, N. DAK.

LOCATION.--Lat 46°37'35", long 97°00'05", in NE¼NW¼ sec.5, T.136 N., R.50 W., Richland County, temperature recorder at gaging station, on right bank 25 ft (7.6 m) downstream from Burlington Northern Railway bridge, 1.5 mi (2.4 km) southeast of Kindred, and at mile 68.1 (kilometre 109.6).

DRAINAGE AREA.--8,800 mi<sup>2</sup> (22,790 km<sup>2</sup>), approximately, of which about 5,780 mi<sup>2</sup> (14,970 km<sup>2</sup>) is probably noncontributing (includes 3,800 mi<sup>2</sup> (9,840 km<sup>2</sup>) in closed basins).

PERIOD OF RECORD.--November 1970 to current year.

EXTREMES.--Current year:

Water temperatures: Maximum recorded, 28.5°C July 7-8; minimum, freezing point on many days during winter months.

REMARKS.--Values were estimated Dec. 28 to Feb. 7.

## TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	10.0	9.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	11.5	10.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	12.0	11.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	12.5	12.0	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	12.5	11.5	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	11.5	9.5	3.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	9.5	9.0	3.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	9.0	9.0	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	9.0	8.5	2.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	9.5	8.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	10.5	9.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	10.5	10.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	10.5	9.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	9.0	8.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	8.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	6.5	6.0	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0
17	6.0	3.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
18	3.5	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
19	2.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0
20	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0
21	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0
22	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
23	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	5.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0
28	5.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.0
29	4.0	2.5	0.0	0.0	---	---	0.0	0.0	---	---	2.0	1.0
30	2.5	2.0	0.0	0.0	---	---	0.0	0.0	---	---	2.0	1.5
31	2.0	2.0	---	---	0.0	0.0	0.0	0.0	---	---	3.0	1.5
MONTH	12.5	1.0	3.5	0.0	0.5	0.0	0.0	0.0	0.5	0.0	3.0	0.0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	4.0	3.0	9.5	9.5	---	---	21.5	20.0	22.0	21.5	24.0	22.5
2	4.5	4.0	---	---	---	---	22.5	21.5	23.0	22.0	22.5	22.5
3	5.5	4.5	---	---	---	---	23.5	22.5	24.0	22.5	22.5	22.5
4	6.0	5.5	---	---	---	---	23.5	23.0	25.0	23.5	22.5	21.5
5	7.5	6.0	---	---	---	---	24.5	23.5	26.0	25.0	21.5	19.5
6	7.5	7.0	---	---	---	---	27.0	24.5	25.5	24.5	19.5	19.0
7	7.0	5.5	---	---	---	---	28.5	27.0	25.0	24.5	17.5	17.0
8	5.5	4.5	---	---	---	---	28.5	26.5	25.0	24.0	18.0	17.5
9	4.5	4.0	---	---	---	---	26.5	25.5	24.0	23.0	18.0	18.0
10	4.5	3.5	---	---	---	---	---	---	23.0	22.0	18.0	18.0
11	6.0	4.5	---	---	21.5	21.5	---	---	22.5	22.0	18.0	18.0
12	7.5	5.5	---	---	21.5	20.0	22.5	22.0	23.0	22.0	18.0	17.5
13	9.0	7.5	---	---	21.0	20.0	22.0	21.0	23.5	22.5	17.5	16.5
14	11.5	9.0	---	---	21.0	23.0	21.0	20.0	23.5	23.5	16.5	16.0
15	11.5	10.0	---	---	23.0	25.5	20.0	19.5	24.0	23.0	16.0	14.0
16	10.0	8.0	---	---	25.5	24.5	21.0	20.0	25.0	23.5	14.0	12.0
17	8.5	11.0	---	---	24.5	23.5	22.5	21.0	25.5	24.5	12.0	12.0
18	13.0	10.5	---	---	23.5	23.0	23.0	22.0	26.5	25.5	12.0	12.0
19	13.0	13.0	---	---	23.0	20.5	23.0	22.0	26.5	26.0	12.0	12.0
20	13.0	12.5	---	---	20.5	19.0	22.5	22.0	26.0	23.0	12.0	11.5
21	13.0	12.5	---	---	19.0	18.5	22.5	22.0	23.0	22.0	11.5	11.0
22	12.5	11.5	---	---	20.5	18.5	22.5	22.0	22.0	22.0	11.0	11.0
23	9.5	8.0	---	---	23.0	20.5	22.0	21.5	22.0	21.5	11.0	11.0
24	8.5	8.0	---	---	23.0	20.5	22.0	21.5	21.5	21.5	12.0	11.0
25	8.5	9.5	---	---	24.5	23.0	22.0	22.0	21.5	21.5	13.0	12.0
26	10.0	9.5	---	---	24.5	24.0	22.5	22.5	22.5	21.5	14.0	13.0
27	10.0	9.5	---	---	24.0	23.0	22.5	22.5	24.5	22.5	14.0	14.0
28	10.0	9.5	---	---	23.0	22.5	22.5	21.0	25.0	24.5	14.0	14.0
29	9.5	9.5	---	---	22.5	20.5	21.0	21.5	25.0	24.5	14.0	14.0
30	9.0	9.5	---	---	20.5	20.0	21.5	21.5	25.0	24.0	14.0	14.0
31	---	---	---	---	---	---	21.5	21.5	24.5	24.0	---	---
MONTH	13.0	3.0	---	---	---	---	28.5	19.5	26.5	21.5	24.0	11.0

## 05059700 MAPLE RIVER NEAR ENDERLIN, N. DAK.

LOCATION.--Lat 46°37'18", long 97°34'25", on west line sec. 2, T.136 N., R.55 W., Ransom County, at gaging station on left bank 25 ft (7.6 m) downstream from county highway bridge, 1 mi (1.6 km) downstream from South Branch 1.2 mi (1.9 km) east of Enderlin.

DRAINAGE AREA.--843 mi<sup>2</sup> (2,183 km<sup>2</sup>), of which about 47 mi<sup>2</sup> (122 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--October 1972 to September 1973 (discontinued).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
NOV.										
08...	1045	4.9	21	140	840	160	74	110	11	418
30...	1500	5.1	21	0	1000	180	86	120	11	454
FEB.										
08...	1300	5.0	21	0	760	200	100	160	16	525
MAR.										
06...	1200	19	12	240	400	79	37	69	14	228
APR.										
04...	1100	50	18	--	340	124	65	79	14	263
MAY										
01...	1730	13	11	--	380	170	94	130	13	416
JUNE										
12...	1205	3.2	23	0	160	180	71	140	11	456
JULY										
10...	1330	2.3	26	150	1200	200	60	91	9.1	466
AUG.										
07...	1200	2.0	28	250	1400	200	68	94	9.3	473
SEP.										
06...	1400	1.9	29	40	1100	190	62	78	8.7	458

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (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)
NOV.										
08...	0	343	460	84	.2	.56	.02	1130	1.54	14.9
30...	0	372	520	95	.3	.54	.11	1260	1.71	17.4
FEB.										
08...	0	431	650	130	.6	.79	.11	1570	2.14	21.2
MAR.										
06...	0	187	250	54	.4	.56	.31	634	.86	32.5
APR.										
04...	0	216	460	48	.1	3.2	.16	982	1.34	133
MAY										
01...	0	341	590	88	.2	.23	.06	1320	1.80	46.3
JUNE										
12...	0	374	490	140	.2	.36	.26	1330	1.81	11.5
JULY										
10...	0	382	450	95	.2	.56	.18	1220	1.66	7.58
AUG.										
07...	0	388	440	100	.3	.23	.10	1290	1.76	6.97
SEP.										
06...	0	376	420	67	.6	.45	.06	1100	1.50	5.65

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
NOV.									
08...	700	360	25	1.8	1630	8.1	2.5	5.3	260
30...	800	430	24	1.8	1780	8.1	.0	5.8	470
FEB.									
08...	910	480	27	2.3	2120	7.6	.0	21	0
MAR.									
06...	350	160	29	1.6	956	7.4	.5	15	0
APR.									
04...	580	360	22	1.4	1050	7.5	5.5	13	340
MAY									
01...	810	470	25	2.0	1780	8.1	9.0	5.3	220
JUNE									
12...	740	370	29	2.2	1860	7.8	18.0	12	130
JULY									
10...	750	360	21	1.4	1670	7.7	23.0	15	40
AUG.									
07...	780	390	21	1.5	1730	7.5	20.0	24	520
SEP.									
06...	730	350	19	1.3	1550	7.6	18.5	18	170

## RED RIVER OF THE NORTH BASIN

05060600 SHEYENNE RIVER NEAR HARWOOD, N. DAK.

LOCATION.--Lat 47°00'05", long 96°53'40", in SW¼NW¼ sec.28, T.141 N., R.49 W., Cass County, 2 mi (3.2 km) northwest of Harwood, 10 mi (16 km) upstream from mouth, at bridge on U.S. Highway 81.

DRAINAGE AREA.--10,700 mi<sup>2</sup> (27,700 km<sup>2</sup>), approximately, of which about 5,850 mi<sup>2</sup> (15,150 km<sup>2</sup>) is probably non-contributing - includes 3,800 mi<sup>2</sup> (9,800 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--July 1969 to current year.

REMARKS.--Discharge obtained from the record of station 05059500 Sheyenne River at West Fargo during winter low flow, rating table at station during mid-flow; and current-meter measurements at high flows when backwater from the Red River might exist.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)
NOV.										
01...	1400	64	89	34	--	354	0	290	180	47
28...	1430	94	93	37	--	372	0	305	220	51
JAN.										
09...	1030	70	87	35	92	396	0	325	190	46
MAR.										
07...	1030	190	72	30	--	335	0	275	170	38
APR.										
04...	1000	390	90	36	64	267	0	219	240	34
MAY										
02...	1000	110	99	43	--	379	0	311	250	46
31...	1000	95	96	40	--	394	0	323	250	120
JUNE										
27...	1530	60	83	34	80	315	0	258	210	50
JULY										
24...	1100	40	84	32	--	359	0	294	160	49
AUG.										
28...	1230	40	--	--	--	--	--	--	--	--
SEP.										
26...	1130	145	65	31	60	218	0	179	190	39

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)
NOV.										
01...	--	.00	.02	.12	.06	644	.88	111	360	72
28...	--	.04	.03	.20	.04	728	.99	185	380	79
JAN.										
09...	.5	.63	.38	.19	.12	708	.96	134	360	37
MAR.										
07...	--	1.2	.27	.43	.27	632	.86	324	300	29
APR.										
04...	.3	1.9	.15	.32	.08	664	.90	699	370	150
MAY										
02...	--	.01	.10	.16	.03	767	1.04	228	420	110
31...	--	.08	.97	.71	.48	880	1.20	226	400	81
JUNE										
27...	.4	.01	.05	.26	.08	676	.92	110	350	89
JULY										
24...	--	.13	.15	.27	.11	626	.85	67.6	340	47
AUG.										
28...	--	--	--	--	--	--	--	--	--	--
SEP.										
26...	.3	.78	.16	.56	.25	536	.73	210	290	110

DATE	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	AIR TEMPERATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)
NOV.										
01...	--	980	8.3	2.5	.0	12.8	99	3.8	430	140
28...	--	1060	8.5	.0	-2.0	14.4	102	2.4	260	830
JAN.										
09...	2.1	1040	7.8	.0	-23.0	5.3	37	7.6	61	230
MAR.										
07...	--	870	7.9	.0	.0	9.2	65	6.0	1700	470
APR.										
04...	1.4	950	8.2	4.5	1.5	11.0	87	6.1	1600	81
MAY										
02...	--	1100	8.3	8.5	5.5	10.6	93	3.3	460	85
31...	--	1340	8.2	19.0	21.5	6.8	75	7.4	630	170
JUNE										
27...	1.9	1010	8.1	20.5	23.5	9.6	110	5.3	870	144
JULY										
24...	--	900	8.2	21.0	22.0	7.6	87	4.4	1600	400
AUG.										
28...	--	1400	8.4	25.5	34.5	7.4	92	>26	2400	440
SEP.										
26...	1.5	800	8.5	14.0	14.0	12.2	121	3.6	>8000	4600

B - Results based on colony count outside the acceptable range.

## RED RIVER OF THE NORTH BASIN

49

05064900 BEAVER CREEK NEAR FINLEY, N. DAK.  
(Hydrologic bench-mark station)

LOCATION.--Lat 47°35'40", long 97°42'18", in NE¼ sec.31, T.148 N., R.55 W., Steele County, at gaging station on right bank 500 ft (150 m) upstream from bridge on county road and 7 mi (11 km) northeast of Finley.

DRAINAGE AREA.--160 mi<sup>2</sup> (410 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

REMARKS.--No flow Oct. 1 to Feb. 19, June 6-15 and July 8 to Sept. 30.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)
MAR. 09...	1030	10	12	--	170	490	51	22	40	14	160	0
APR. 05...	1300	3.9	15	10	70	170	85	33	67	8.9	233	0
MAY 01...	1230	.26	9.7	--	50	80	120	55	98	10	323	0
30...	0930	.42	10	--	40	310	140	69	130	5.6	368	0
JUNE 26...	1100	3.8	25	--	50	110	64	25	46	7.6	234	0

DATE	ALKALINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	TOTAL FILTRABLE RESIDUE (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NON-FILTRABLE RESIDUE (MG/L)	HARDNESS (CA+MG) (MG/L)
MAR. 09...	131	170	16	.4	.91	.35	462	--	.63	12.5	--	220
APR. 05...	191	270	17	.3	.24	.04	677	700	.92	7.13	14	350
MAY 01...	265	410	33	.1	.03	.03	948	--	1.29	.67	--	530
30...	302	530	44	.3	.02	.03	1200	--	1.63	1.36	--	630
JUNE 26...	192	170	9.4	.3	.00	.09	489	--	.67	5.02	--	260

DATE	NON-CARBONATE HARDNESS (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	AIR TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)
MAR. 09...	87	27	1.2	600	8.0	.0	.0	90	11.8	85	8.4	85000
APR. 05...	160	29	1.6	900	8.5	8.0	8.0	40	12.8	112	16	800
MAY 01...	260	28	1.9	1300	8.2	9.5	9.0	20	11.0	101	1.2	B10
30...	330	31	2.2	1650	8.3	16.5	24.5	30	7.6	81	4.0	B4500
JUNE 26...	71	27	1.2	700	8.0	18.5	17.0	40	7.6	84	2.7	B3900

DATE	FECAL COLIFORM (COL. PER 100 ML)	TOTAL ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	ALDRIN (UG/L)	ALDRIN IN BOTTOM DEPOSITS (UG/KG)	CHLOR-DANE (UG/L)	CHLOR-DANE IN BOTTOM DEPOSITS (UG/KG)	DDD (UG/L)	DDD IN BOTTOM DEPOSITS (UG/KG)	DDE (UG/L)	DDE IN BOTTOM DEPOSITS (UG/KG)	DDT (UG/L)
MAR. 09...	--	--	--	--	--	--	--	--	--	--	--	--
APR. 05...	--	--	.01	--	--	--	--	--	--	--	--	--
MAY 01...	--	18	--	.00	.0	.0	0	.00	.0	.00	.0	.00
30...	1370	--	--	--	--	--	--	--	--	--	--	--
JUNE 26...	--	--	--	--	--	--	--	--	--	--	--	--

B - Results based on colony count outside the acceptable range.



05064900 BEAVER CREEK NEAR FINLEY, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

[illegible][illegible][illegible][illegible]

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.  
(Pesticide station)

LOCATION.--Lat 47°56'34", long 97°03'10", in SW&NE¼ sec.33, T.152 N., R.50 W., Grand Forks County, at dam at Riverside Park in Grand Forks, 1,500 ft (460 m) upstream from gaging station, 2.0 mi (3.2 km) downstream from Red Lake River, and at mile 295.7 (kilometre 475.8).

DRAINAGE AREA.--30,100 mi<sup>2</sup> (78,000 km<sup>2</sup>), approximately - includes 3,800 mi<sup>2</sup> (9,800 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--Chemical analyses: September 1956 to September 1973 (discontinued).

Specific conductance: October 1956 to September 1973 (discontinued).

Water temperatures: October 1956 to September 1973 (discontinued).

## EXTREMES.--Current year:

Dissolved solids: Maximum, 440 mg/l Apr. 1-30; minimum observed, 260 mg/l Oct. 1-31.

Hardness: Maximum, 300 mg/l Apr. 1-30; minimum observed, 210 mg/l Oct. 1-31.

Specific conductance: Maximum daily, 807 micromhos Apr. 16; minimum daily, 397 micromhos Oct. 1.

Water temperatures: Maximum daily, 24.5°C Aug. 18-20; minimum daily, freezing point on many days during winter months.

## Period of record:

Dissolved solids (1956-58, 1959-73): Maximum, 540 mg/l Jan. 21, 1962; minimum, 191 mg/l Mar. 24, 1966.

Hardness: Maximum, 468 mg/l Dec. 29-31, 1958; minimum, 126 mg/l Apr. 12, 1965.

Specific conductance: Maximum daily, 976 micromhos Dec. 29-31, 1958; minimum daily, 278 micromhos Mar. 26, 1966.

Water temperatures: Maximum daily, 28.0°C July 19, 1964; minimum daily, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Dissolved solids, 459 mg/l Apr. 6. Minimum observed during the year: Hardness, 200 mg/l Oct. 2.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.								
01-31	1800	47	22	12	231	0	189	260
NOV.								
01-30	1410	51	24	13	257	0	211	306
DEC.								
01-31	1160	54	28	19	288	0	236	360
JAN.								
01-31	1120	54	25	16	272	0	223	321
FEB.								
01-28	1160	56	25	18	286	0	235	328
MAR.								
01-31	5470	51	23	16	192	0	157	323
APR.								
01-30	1960	67	33	26	260	0	213	440
MAY								
01-31	1360	63	30	21	282	0	231	411
JUNE								
01-30	1030	58	30	22	271	0	222	385
JULY								
01-31	560	55	30	21	269	0	221	361
AUG.								
01-31	737	49	26	16	248	0	203	324
SEP.								
01-30	3070	49	--	--	211	0	173	--
WTD. AVG.	--	54	26	18	237	0	194	342
TIME WTD.								
AVG.	1740	54	27	18	255	0	209	347
TONS								
PER DAY	--	252	104	71	1110	0	912	--

DATE	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	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH
OCT.							
01-31	.35	1260	210	18	.4	419	7.6
NOV.							
01-30	.42	1170	230	15	.4	475	7.8
DEC.							
01-31	.49	1130	250	14	.5	551	8.0
JAN.							
01-31	.44	971	240	15	.5	501	8.1
FEB.							
01-28	.45	1030	240	8	.5	532	7.8
MAR.							
01-31	.44	4770	220	65	.5	503	7.9
APR.							
01-30	.60	2330	300	90	.7	666	7.4
MAY							
01-31	.56	1510	280	50	.5	605	8.0
JUNE							
01-30	.52	1070	270	46	.6	599	8.1
JULY							
01-31	.49	546	260	40	.6	564	8.1
AUG.							
01-31	.44	645	230	26	.5	494	8.2
SEP.							
01-30	--	--	--	--	--	439	8.1
WTD. AVG.	.47	--	242	44	.5	516	7.9
TIME WTD.							
AVG.	.47	--	248	35	.5	529	7.9
TONS							
PER DAY	--	--	--	--	--	--	--

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
OCT.												
02...	1600	1660	6.1	0	280	8	47	21	11	4.2	222	0
25...	1600	1900	5.6	--	--	--	48	22	10	3.3	223	0
NOV.												
22...	1030	1210	7.2	10	30	30	58	27	16	3.9	273	11
DEC.												
21...	1400	1190	8.1	--	--	--	57	27	22	4.0	290	0
JAN.												
24...	1400	1100	10	--	--	--	51	25	15	4.1	275	0
FEB.												
22...	1500	1150	11	--	--	--	54	27	20	4.1	292	0
APR.												
06...	1500	2800	12	30	1500	50	68	31	25	7.4	249	0
24...	1130	1430	1.9	--	--	--	64	34	26	6.6	278	0
MAY												
24...	1500	1270	2.4	--	--	--	61	29	20	4.7	278	0
JULY												
24...	1100	421	14	--	--	--	52	28	19	4.3	261	0
AUG.												
24...	1230	743	13	--	--	--	56	19	14	4.2	215	7
SEP.												
25...	1600	2600	15	0	40	24	47	19	8.9	3.6	221	0
26...	1400	3450	--	--	--	--	--	--	--	--	--	--

DATE	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VEN- PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
OCT.												
02...	182	43	6.9	.3	.03	.10	276	.38	1240	200	22	10
25...	183	34	6.3	.3	.02	.10	274	.37	1410	210	28	9
NOV.												
22...	242	49	9.8	.3	.49	.16	354	.48	1160	260	14	12
DEC.												
21...	238	49	14	.2	.15	.19	360	.49	1160	250	16	16
JAN.												
24...	226	38	9.5	.3	.32	.24	334	.45	992	230	5	12
FEB.												
22...	240	51	9.7	.3	.44	.17	362	.49	1120	250	7	15
APR.												
06...	204	130	12	.3	.61	.07	459	.62	3470	300	94	15
24...	228	120	14	.3	.00	.09	436	.59	1680	300	72	16
MAY												
24...	228	74	13	.3	.01	.11	373	.51	1280	270	44	14
JULY												
24...	214	48	12	.3	.08	.27	333	.45	379	250	31	14
AUG.												
24...	188	51	9.6	.4	.03	.21	329	.45	660	220	30	12
SEP.												
25...	181	31	4.5	.3	.16	.14	268	.36	1880	200	14	9
26...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/L)	ALDRIN (UG/L)	ALDRIN IN BOTTOM DE- POSITS (UG/KG)	CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM DE- POSITS (UG/KG)	DDD (UG/L)	DDD IN BOTTOM DE- POSITS (UG/KG)
OCT.												
02...	.3	421	7.8	10.5	10	.00	--	--	--	--	--	--
25...	.3	428	7.6	3.5	--	--	--	--	--	--	--	--
NOV.												
22...	.4	510	8.7	.0	20	.00	.00	.0	.0	0	.00	.0
DEC.												
21...	.6	500	7.8	.0	10	--	.00	--	.0	--	.00	--
JAN.												
24...	.4	494	7.6	.0	10	--	--	--	--	--	--	--
FEB.												
22...	.6	553	7.7	.0	10	--	--	--	--	--	--	--
APR.												
06...	.6	654	8.0	6.5	30	.01	.00	--	.0	--	.00	--
24...	.7	676	8.2	10.0	20	--	--	--	--	--	--	--
MAY												
24...	.5	578	8.1	18.5	30	--	--	--	--	--	--	--
JULY												
24...	.5	523	8.3	23.0	20	--	--	--	--	--	--	--
AUG.												
24...	.4	512	8.4	23.0	40	--	--	--	--	--	--	--
SEP.												
25...	.3	401	8.1	11.5	40	.00	--	--	--	--	--	--
26...	--	--	--	11.5	--	--	.00	.0	.0	0	.00	.0

## RED RIVER OF THE NORTH BASIN

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05082500 RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DDE (UG/L)	DDE IN BOTTOM DE- POSITS (UG/KG)	DDT (UG/L)	DDT IN BOTTOM DE- POSITS (UG/KG)	DI- AZINON (UG/L)	DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM DE- POSITS (UG/KG)	ENDRIN (UG/L)	ENDRIN IN BOTTOM DE- POSITS (UG/KG)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM DE- POSITS (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/L)
NOV. 22...	.00	.0	.00	.0	.00	.00	.0	.00	.0	.00	.0	.00
DEC. 21...	.00	--	.00	--	.01	.00	--	.00	--	.00	--	.00
APR. 06...	.00	--	.00	--	.00	.00	--	.00	--	.00	--	.00
SEP. 25...	--	--	--	--	--	--	--	--	--	--	--	--
26...	.00	.0	.00	.0	.01	.00	.0	.00	.0	.00	.0	.00

DATE	HEPTA- CHLOR EPOXIDE IN BOT- TOM DE- POSITS (UG/KG)	LINDANE (UG/L)	LINDANE IN BOTTOM DE- POSITS (UG/KG)	MALA- THION (UG/L)	METHYL PARA- THION (UG/L)	PARA- THION (UG/L)	PCB (UG/L)	PCB IN BOTTOM DE- POSITS (UG/KG)	2,4-D (UG/L)	2,4,5-T (UG/L)	SILVEX (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)
OCT. 02...	--	--	--	--	--	--	--	--	--	--	--	5
25...	--	--	--	--	--	--	--	--	--	--	--	--
NOV. 22...	.0	.00	.0	.00	.00	.00	.0	0	.00	.00	.00	0
DEC. 21...	--	.00	--	.00	.00	.00	.0	--	.03	.00	.00	--
APR. 06...	--	--	--	.00	.00	.00	.0	--	.07	.02	.00	7
SEP. 25...	--	--	--	--	--	--	--	--	--	--	--	3
26...	.0	.00	.0	.00	.00	.00	.0	0	.02	.00	.00	--

DATE	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 LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)
OCT. 02...	0	0	90	1	0	2	6	4	10
25...	--	--	100	--	--	--	--	--	--
NOV. 22...	0	0	70	0	0	0	12	1	10
DEC. 21...	--	--	110	--	--	--	--	--	--
JAN. 24...	--	--	110	--	--	--	--	--	--
FEB. 22...	--	--	80	--	--	--	--	--	--
APR. 06...	300	0	40	0	0	2	<10	0	30
24...	--	--	110	--	--	--	--	--	--
MAY 24...	--	--	100	--	--	--	--	--	--
JULY 24...	--	--	120	--	--	--	--	--	--
AUG. 24...	--	--	100	--	--	--	--	--	--
SEP. 25...	0	0	50	0	0	0	3	2	20

DATE	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED NICKEL (NI) (UG/L)	DIS- SOLVED SELF- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED STRON- TIUM (SK) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT. 02...	1.4	1	10	4	4	140	1.4	20
25...	--	--	--	--	--	--	--	--
NOV. 22...	.6	2	2	5	2	210	.3	20
APR. 06...	.3	2	13	1	1	250	.4	10
SEP. 25...	.4	1	2	9	0	120	.0	10

## RED RIVER OF THE NORTH BASIN

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.---Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

(CONCE-DAILY MEASUREMENT AT 0800)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	397	422	522	502	508	549	661	640	607	568	472	510
2	408	422	523	520	510	549	681	640	600	577	478	520
3	405	427	517	514	508	538	708	630	601	580	489	520
4	405	428	526	500	510	527	728	631	601	572	480	560
5	403	430	537	500	510	541	740	629	600	602	469	550
6	404	424	533	510	512	579	750	630	588	611	462	515
7	404	427	539	500	522	535	754	632	580	608	469	474
8	408	432	552	496	532	538	763	639	584	610	482	428
9	407	441	563	499	532	541	758	632	597	596	453	428
10	420	444	565	501	531	572	770	613	580	579	457	436
11	427	452	570	490	531	545	760	612	591	570	447	468
12	450	457	567	499	530	501	775	604	590	557	440	470
13	446	462	555	499	521	472	800	587	645	562	436	470
14	446	467	552	499	519	409	780	572	700	563	443	475
15	420	492	539	500	531	471	792	561	670	553	472	475
16	421	488	523	500	551	462	807	567	643	548	485	475
17	467	488	539	494	550	451	800	577	625	529	510	470
18	413	487	548	489	540	439	802	589	608	530	516	458
19	417	504	543	489	548	438	782	597	595	520	520	450
20	412	500	537	489	545	449	769	610	595	511	520	450
21	412	496	528	491	548	458	772	617	590	513	513	442
22	402	512	518	493	543	486	765	589	612	513	517	442
23	409	513	515	490	554	518	759	578	612	527	512	433
24	435	507	517	491	551	527	765	587	600	522	514	410
25	427	497	513	497	554	549	747	587	591	508	520	415
26	413	510	504	498	557	559	725	608	598	490	527	410
27	410	512	503	497	560	557	710	570	572	493	511	430
28	420	512	514	503	552	557	720	578	570	511	508	430
29	422	512	508	509	---	562	729	569	572	532	503	430
30	427	501	513	513	---	570	721	548	578	527	496	430
31	422	---	514	517	---	591	---	560	---	511	495	---
MONTH	419	472	532	500	534	517	753	599	603	548	488	462

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

(CONCE-DAILY MEASUREMENT AT 0800)												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.0	2.0	0.5	0.5	0.5	0.5	3.0	10.5	19.5	21.0	21.0	23.5
2	10.0	2.0	0.5	0.5	0.5	0.5	4.5	10.5	21.0	21.0	21.0	23.0
3	10.0	2.0	0.5	0.5	0.5	0.5	5.5	10.5	21.0	21.0	21.5	22.0
4	11.0	2.0	0.5	0.5	0.5	0.5	5.5	10.5	21.0	21.0	22.0	21.5
5	10.0	2.0	0.5	0.5	0.5	0.5	6.0	11.0	21.0	22.0	22.0	20.5
6	10.0	2.0	0.5	0.5	0.5	0.5	6.0	11.0	20.0	23.0	22.0	19.5
7	10.0	2.0	0.5	0.5	0.5	0.5	6.0	13.0	20.0	23.5	23.0	18.5
8	10.0	2.0	0.5	0.5	0.5	0.5	6.0	15.5	20.0	24.0	22.0	18.5
9	10.0	2.0	0.5	0.5	0.5	0.5	6.0	15.5	20.0	24.0	22.0	18.5
10	10.0	2.0	0.5	0.5	0.5	0.5	6.0	15.5	21.0	24.0	22.0	18.5
11	9.5	1.5	0.5	0.5	0.5	0.5	6.0	15.5	21.0	24.0	22.0	18.5
12	9.5	1.5	0.5	0.5	0.5	0.5	6.0	14.0	21.0	24.0	23.0	18.5
13	9.5	1.0	0.5	0.5	0.5	0.5	6.0	14.5	21.0	24.0	22.0	18.5
14	8.5	1.0	0.5	0.5	0.5	0.5	7.0	13.5	22.0	24.0	23.0	18.5
15	8.5	1.0	0.5	0.5	0.5	0.5	6.5	14.0	22.0	23.5	23.0	17.0
16	8.0	1.0	0.5	0.5	0.5	0.5	6.5	14.0	24.0	24.0	23.0	14.5
17	6.0	1.0	0.5	0.5	0.5	0.5	6.5	14.0	22.0	24.0	23.5	14.5
18	5.0	0.5	0.5	0.5	0.5	0.5	8.0	14.5	24.0	23.5	24.5	14.5
19	4.5	0.5	0.5	0.5	0.5	0.5	9.5	14.5	23.0	23.5	24.5	14.0
20	4.5	0.5	0.5	0.5	0.5	0.5	10.5	15.5	23.5	22.0	24.5	14.0
21	3.5	0.5	0.5	0.5	0.5	0.5	11.5	16.5	20.5	22.0	23.5	14.0
22	3.5	0.5	0.5	0.5	0.5	0.5	10.5	19.0	20.5	22.0	23.5	11.5
23	2.0	0.5	0.5	0.5	0.5	0.5	10.0	19.0	21.0	22.0	22.0	11.0
24	3.5	0.5	0.5	0.5	0.5	0.5	10.0	18.5	21.0	22.0	23.0	11.0
25	3.5	0.5	0.5	0.5	0.5	0.5	9.5	18.0	21.0	23.0	22.0	11.0
26	4.0	0.5	0.5	0.5	0.5	1.0	9.5	17.0	21.0	23.0	23.0	10.0
27	4.0	0.5	0.5	0.5	0.5	1.0	10.0	17.0	21.0	22.0	23.0	13.0
28	4.0	0.5	0.5	0.5	0.5	2.0	10.0	17.0	21.5	22.0	24.0	14.0
29	3.5	0.5	0.5	0.5	---	2.0	10.5	18.0	21.0	22.0	24.0	13.5
30	3.5	0.5	0.5	0.5	---	2.0	10.5	18.5	21.0	21.0	24.0	14.0
31	3.0	---	0.5	0.5	---	3.0	---	19.5	---	21.0	24.0	---
MONTH	7.0	1.5	0.5	0.5	0.5	1.0	7.5	15.0	21.5	22.5	23.0	16.0



05083500 RED RIVER OF THE NORTH AT OSLO, MINN.  
(National stream-quality accounting network station)

LOCATION.--Lat 48°11'40", long 97°08'30", in SW¼SW¼ sec.36, T.15S N., R.51 W., in Walsh County, on interstate highway bridge at Oslo, and at mile 271.2 (kilometre 436.4).

DRAINAGE AREA.--31,200 mi<sup>2</sup> (80,800 km<sup>2</sup>) approximately, includes 3,800 mi<sup>2</sup> (9,840 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--March 1973 to current year.

REMARKS.--Discharge obtained from the record at station 05082500 Red River of the North at Grand Forks during low and mid-flow and rating table at station during high flow.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
MAR. 15...	1600	6500	11	--	--	--	--	48	21	23	7.2	203
MAY 16...	1400	1500	2.2	1100	9	210	30	--	--	--	--	--
JUNE 21...	1130	890	9.4	--	--	--	--	59	31	32	6.2	257
JULY 26...	1100	420	14	--	--	--	--	51	28	23	4.9	256
SEP. 13...	1130	3300	20	--	--	--	--	56	22	14	5.0	242

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (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)
MAR. 15...	0	167	59	26	.3	1.5	2.3	3.8	.46	336	.46	5900
MAY 16...	--	--	--	--	--	.01	1.3	1.3	.18	453	--	1840
JUNE 21...	0	211	88	22	.3	.73	1.5	2.2	.55	402	.55	966
JULY 26...	0	210	61	15	.3	.29	1.2	1.5	.33	356	.48	404
SEP. 13...	0	198	55	12	.3	.29	1.3	1.6	.26	323	.44	2880

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION
MAR. 15...	210	40	19	.7	500	--	.0	--	40	--	--
MAY 16...	--	--	--	--	710	--	14.0	--	20	9.9	97
JUNE 21...	280	64	20	.8	650	7.9	20.0	19.0	70	5.0	56
JULY 26...	240	33	17	.6	530	8.2	23.0	25.0	50	5.4	64
SEP. 13...	230	32	11	.4	460	8.0	18.0	16.5	30	6.8	73

DATE	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREP- TOCOCCI (COL- ONIES PER 100 ML)	TOTAL ORGANIC CARBON (C) (MG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
MAR. 15...	--	--	--	--	--	--	--	--	--	--	--
MAY 16...	1300	150	B33	17	4	3	0	0	0	0	<20
JUNE 21...	4800	1000	160	--	--	--	--	--	--	--	--
JULY 26...	B500	<11	B110	--	--	--	--	--	--	--	--
SEP. 13...	B19000	1300	1300	--	--	--	--	--	--	--	--

B - Results based on colony count outside the acceptable range.

## RED RIVER OF THE NORTH BASIN

05083500 RED RIVER OF THE NORTH AT OSLO, MINN.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR. 15...	--	--	--	--	--	--	--	--	--	--	--
MAY 16...	1	10	10	<100	2	.4	.2	4	5	30	10
JUNE 21...	--	--	--	--	--	--	--	--	--	--	--
JULY 26...	--	--	--	--	--	--	--	--	--	--	--
SEP. 13...	--	--	--	--	--	--	--	--	--	--	--

DATE	SUS-PENDED SEDIMENT (MG/L)	SUS-PENDED SEDIMENT DIS-CHARGE (T/DAY)	SUS- SED. FALL DIAM. % FINER THAN .062 MM
MAR. 15...	116	2040	--
MAY 16...	78	316	--
JUNE 21...	234	562	--
JULY 26...	114	129	98
SEP. 13...	125	1110	95

## BIOLOGICAL ANALYSES AND DISSOLVED OXYGEN PROFILE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

## TWENTY-FOUR HOUR DISSOLVED OXYGEN PROFILE

DATE	MG/L	DATE	MG/L	DATE	MG/L	DATE	MG/L
May 16, 1973		1700	10.2	2400	9.8	0600	9.5
1000	9.6	1800	10.2	May 17, 1973		0700	9.4
1100	9.6	1900	10.1	0100	9.8	0800	9.5
1200	9.7	2000	10.1	0200	9.7	0900	9.6
1300	9.8	2100	10.0	0300	9.6	1000	9.6
1400	9.9	2200	9.9	0400	9.6	1100	9.7
1500	10.0	2300	9.9	0500	9.5	1200	9.8
1600	10.1						

## PHYTOPLANKTON

DATE	TOTAL COUNT CELLS/ML	PERCENT COMPOSITION	3-CODOMINANT GENERA	ALGAL GROUP
730315	2,900	32 22	<i>Cyclotella</i> <i>Fragilaria</i>	Diatom Diatom
730621	14	51 18	<i>Scenedesmus</i> <i>Chlamydomonadaceae</i>	Green Flagellate
730726	72	27 15	<i>Synedra</i> <i>Pediastrum</i>	Diatom Green
730913	59	45 17	<i>Melosira</i> <i>Scenedesmus</i>	Diatom Green

## PERIPHYTON

Collected by plastic strip sampler, placed approximately one month prior to collection date in stream at midpoint of the downstream side railroad bridge pier at left edge of water.

## BIOMASS

DATE	DRY WEIGHT G/M <sup>2</sup>	ASH WEIGHT G/M <sup>2</sup>	3-CODOMINANT GENERA	ALGAL GROUP
730726	7.5	1.7	<i>Cocconeis</i> <i>Navicula</i>	Diatom Diatom

## BENTHIC INVERTEBRATES

Collected by multiple-plate sampler, placed approximately one month prior to collection date in stream at midpoint of the downstream side railroad bridge pier at left edge of water.

DATE	BIOMASS G/M <sup>2</sup>	IDENTIFICATION AND COUNT	COMMON NAME
730621	0.1	Amphipoda - 1 Diptera (Chironomidae) - 8 Gastropoda (Physidae) - 1	(Crustacean) Flies and midges (Insect) Snails (Mollusk)



## RED RIVER OF THE NORTH BASIN

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.

LOCATION.--Lat 48°54'50", long 97°55'00", in NE&NE& sec.29, T.163 N., R.56 W., Pembina County, at gaging station at bridge on State Highway 32, at south edge of Walhalla, and 7 mi (11 km) downstream from Little Pembina River.

DRAINAGE AREA.--3,350 mi<sup>2</sup> (8,680 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: March 1962 to current year.

Specific conductance: October 1972 to current year (weekly). Prior to 1972, once daily measurement.

Water temperatures: October 1972 to current year (weekly). Prior to 1972, once daily measurement.

Sediment records: April 1962 to current year.

EXTREMES.--Current year:

Dissolved solids: Maximum observed, 603 mg/l Jan. 1-31; minimum, 368 mg/l Mar. 1-31.

Hardness: Maximum, 400 mg/l Dec. 1-31, Jan. 1-31; minimum, 200 mg/l Mar. 1-31.

Sediment concentrations: Maximum daily, 21,400 mg/l Aug. 9; minimum daily, 30 mg/l on many days.

Sediment discharge: Maximum daily, 14,400 tons Aug. 9; minimum daily, 2.5 tons Jan. 25 - Feb. 2, Feb. 19.

Period of record:

Dissolved solids: Maximum 822 mg/l Jan. 15-31, 1963; minimum, 187 mg/l Apr. 11, 1965.

Hardness: Maximum, 543 mg/l Jan. 15-31, 1963; minimum, 95 mg/l Apr. 11, 1965.

Specific conductance (1962-72): Maximum daily, 1,290 micromhos Feb. 17, 1972; minimum daily, 223 micromhos

Apr. 9, 1971.

Water temperatures (1962-72): Maximum daily, 31.0°C July 24, 1963; minimum daily, freezing point on many days during winter periods.

Sediment concentrations: Maximum daily, 21,400 mg/l Aug. 9, 1973; minimum daily, 3 mg/l Feb. 23, 1965.

Sediment discharge: Maximum daily, 169,000 tons Apr. 11, 1971; minimum daily, less than 0.50 ton on many days.

REMARKS.--Weekly samples for chemical analyses composited by discharge. Flow affected by ice Nov. 12 to Mar. 30.

Maximum observed during water year: Dissolved solids, 636 mg/l Dec. 14, hardness, 450 mg/l Dec. 14. Minimum observed during water year: Dissolved solids, 286 mg/l Mar. 13, hardness, 140 mg/l Mar. 13.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LITY AS CACO3 (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.								
01-31	62	55	35	47	261	0	214	468
NOV.								
01-30	38	69	35	49	303	0	249	522
DEC.								
01-31	7.0	94	41	52	385	0	316	594
JAN.								
01-31	2.7	100	36	41	391	0	321	603
FEB.								
01-28	2.8	96	31	32	393	0	322	541
MAR.								
01-31	97	52	17	36	172	0	141	368
APR.								
01-30	84	64	32	49	272	0	223	562
MAY								
01-31	68	69	35	55	294	0	241	568
JUNE								
01-30	37	71	36	55	307	0	252	557
JULY								
01-31	59	65	32	52	268	0	220	537
AUG.								
01-31	65	75	24	53	372	0	305	544
SEP.								
01-30	66	62	26	52	248	0	203	--
WTD. AVG.	--	64	29	49	271	0	223	507
TIME WTD.								
AVG.	49	73	32	48	305	0	250	533
TONS								
PER DAY	--	8.5	3.8	6.5	36	0	30	--

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	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	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT. 01-31	.64	78.3	280	67	1.2	705	7.6
NOV. 01-30	.71	53.6	320	68	1.2	787	7.9
DEC. 01-31	.81	11.2	400	88	1.1	925	7.9
JAN. 01-31	.82	4.40	400	77	.9	895	8.0
FEB. 01-28	.74	4.09	370	45	.7	840	7.8
MAR. 01-31	.50	96.4	200	59	1.1	556	7.8
APR. 01-30	.76	127	290	68	1.2	766	7.5
MAY 01-31	.77	104	320	75	1.3	808	7.9
JUNE 01-30	.76	55.6	330	74	1.3	838	8.1
JULY 01-31	.73	85.5	290	74	1.3	778	8.2
AUG. 01-31	.74	95.5	290	0	1.4	797	7.6
SEP. 01-30	--	--	260	58	1.4	728	7.9
WTD. AVG. TIME WTD.	.69	--	281	60	1.3	738	7.8
AVG. TONS PER DAY	.73	--	312	63	1.2	785	7.9
	--	--	--	--	--	--	--

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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)
OCT. 12...	0930	72	11	--	--	--	53	32	44	8.1	246	0
NOV. 07...	1615	47	9.8	--	--	--	71	35	49	7.5	305	0
DEC. 14...	1630	5.6	23	--	--	--	110	42	50	8.6	459	0
FEB. 21...	1400	4.0	23	--	--	--	110	29	28	4.9	416	0
MAR. 13...	1500	220	13	--	--	--	36	12	27	5.9	122	0
APR. 04...	1230	97	16	10	20	100	57	23	44	7.6	218	0
MAY 11...	1445	68	17	--	--	--	71	33	53	8.3	287	0
JUNE 15...	1300	37	23	--	--	--	72	36	55	10	318	0
JULY 11...	1500	65	27	--	--	--	72	33	57	11	287	0
AUG. 15...	1330	64	26	--	--	--	67	30	50	10	270	0
SEP. 12...	1230	52	23	10	10	40	63	35	54	9.2	260	13

DATE	ALKA- LITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)
OCT. 12...	202	140	11	.3	.00	.02	476	.65	92.5	260	62
NOV. 07...	250	170	13	.3	.02	.01	572	.78	72.6	320	71
DEC. 14...	376	180	14	.4	.04	.05	636	.87	9.62	450	71
FEB. 21...	341	120	8.9	.4	.13	.05	548	.75	5.92	390	53
MAR. 13...	100	91	5.9	.3	1.7	.27	286	.39	170	140	39
APR. 04...	179	140	11	.3	.02	.06	431	.59	113	240	59
MAY 11...	235	170	14	.2	.00	.04	521	.71	95.7	310	78
JUNE 15...	261	170	14	.3	.00	.05	567	.77	56.6	330	67
JULY 11...	235	180	15	.4	.02	.11	578	.79	101	320	80
AUG. 15...	221	170	12	.3	.05	.12	505	.69	87.3	290	69
SEP. 12...	235	190	13	.3	.02	.13	537	.73	75.4	300	67



## RED RIVER OF THE NORTH BASIN

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	PERCENT SODIUM	SODIUM AD-SORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)
OCT. 12...	26	1.2	710	7.4	4.5	20	--	--	160	--	--
NOV. 07...	24	1.2	786	7.7	.0	30	--	--	170	--	--
DEC. 14...	19	1.0	988	7.2	.0	20	--	--	170	--	--
FEB. 21...	13	.6	831	7.7	.0	8	--	--	90	--	--
MAR. 13...	29	1.0	423	7.7	.0	70	--	--	70	--	--
APR. 04...	28	1.2	644	8.0	6.5	20	2	100	30	0	0
MAY 11...	26	1.3	783	8.1	11.0	20	--	--	170	--	--
JUNE 15...	26	1.3	840	8.2	26.5	20	--	--	130	--	--
JULY 11...	27	1.4	821	8.2	27.5	20	--	--	210	--	--
AUG. 15...	26	1.3	749	8.2	25.0	20	--	--	150	--	--
SEP. 12...	27	1.4	783	8.4	15.0	20	7	0	180	1	0

DATE	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
APR. 04...	2	13	0	40	.1	3	15	4	300	.4	20
SEP. 12...	0	6	2	80	.0	4	8	5	350	.5	10

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPERATURE (DEG C)	DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	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. 13...	1500	.0	220	360	214	44	58	84	97	100	--
23...	1150	1.0	180	483	235	54	72	88	97	99	100
SEP. 25...	1700	15.0	95	9980	2560	--	86	100	--	--	--

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.--Continued

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	80	55	12	49	58	7.7	15	50	2.0
2	78	70	15	60	62	10	15	45	1.8
3	78	81	17	52	66	9.3	14	40	1.5
4	76	76	16	54	69	10	14	40	1.5
5	75	68	14	56	66	10	12	40	1.3
6	74	55	11	54	59	8.6	11	55	1.6
7	72	46	8.9	54	48	7.0	11	55	1.6
8	70	49	9.3	45	74	9.0	10	55	1.5
9	68	42	7.7	47	95	12	10	55	1.5
10	66	43	7.7	47	87	11	9.5	55	1.4
11	70	50	9.5	47	80	10	9.0	60	1.5
12	70	49	9.3	45	80	9.7	8.5	60	1.4
13	64	49	8.5	40	80	8.6	7.0	60	1.1
14	60	45	7.3	35	80	7.6	5.5	65	.97
15	60	46	7.5	33	70	6.2	5.5	65	.97
16	57	48	7.4	30	70	5.7	4.6	70	.87
17	54	63	9.2	30	70	5.7	4.3	75	.87
18	50	63	8.5	30	65	5.3	4.1	80	.89
19	47	53	6.7	30	65	5.3	3.9	80	.84
20	56	39	5.9	30	65	5.3	3.8	70	.72
21	56	38	5.7	32	65	5.6	3.7	65	.65
22	60	45	7.3	32	65	5.6	3.6	60	.58
23	56	46	7.0	32	65	5.6	3.5	60	.57
24	53	42	6.0	30	60	4.9	3.5	60	.57
25	50	36	4.9	30	60	4.9	3.5	60	.57
26	50	31	4.2	30	60	4.9	3.5	60	.57
27	53	31	4.4	25	60	4.1	3.5	60	.57
28	54	32	4.7	20	60	3.2	3.5	65	.61
29	53	30	4.3	18	55	2.7	3.5	65	.61
30	59	41	6.5	16	50	2.2	3.5	65	.61
31	53	54	7.7	--	--	--	3.5	65	.61
TOTAL	1922	--	261.1	1133	--	207.7	216.5	--	32.35

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	3.4	65	.60	2.7	30	.22	2.7	85	.62
2	3.1	65	.54	2.7	30	.22	4.0	90	.97
3	2.8	65	.49	2.7	35	.26	5.0	102	1.4
4	2.7	65	.47	2.7	35	.26	5.3	105	1.5
5	2.7	65	.47	2.7	40	.29	5.7	121	1.9
6	2.7	65	.47	2.7	40	.29	6.3	121	2.1
7	2.7	65	.47	2.7	40	.29	7.7	121	2.5
8	2.7	65	.47	2.7	40	.29	9.0	129	3.1
9	2.7	65	.47	2.7	40	.29	30	214	17
10	2.7	65	.47	2.7	40	.29	90	281	68
11	2.7	65	.47	2.7	40	.29	230	400	255
12	2.7	80	.58	2.7	40	.29	220	291	183
13	2.7	80	.58	2.7	40	.29	210	347	197
14	2.7	75	.55	2.7	40	.29	170	306	140
15	2.7	70	.51	2.7	40	.29	130	177	62
16	2.7	65	.47	2.7	40	.29	80	150	32
17	2.7	65	.47	2.7	35	.26	75	129	26
18	2.7	60	.44	2.7	35	.26	90	148	36
19	2.7	60	.44	2.7	30	.22	85	144	33
20	2.7	55	.40	3.5	30	.28	75	152	31
21	2.7	50	.36	3.5	30	.28	100	152	44
22	2.7	40	.29	4.5	40	.49	160	141	63
23	2.7	40	.29	3.5	45	.43	170	360	174
24	2.7	35	.26	2.7	50	.36	155	316	132
25	2.7	30	.22	2.7	50	.36	140	276	104
26	2.7	30	.22	2.7	55	.40	145	282	110
27	2.7	30	.22	2.7	65	.47	165	363	162
28	2.7	30	.22	2.7	75	.55	130	240	84
29	2.7	30	.22	--	--	--	115	238	74
30	2.7	30	.22	--	--	--	105	190	54
31	2.7	30	.22	--	--	--	95	166	43
TOTAL	84.9	--	12.57	79.8	--	8.80	3010.7	--	2138.09

## RED RIVER OF THE NORTH BASIN

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	APRIL			MAY			JUNE		
	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	95	163	42	78	99	21	53	74	11
2	111	188	56	75	68	14	46	66	8.2
3	101	172	47	74	55	11	41	61	6.8
4	98	142	38	72	54	10	40	56	6.0
5	95	128	33	70	52	9.8	35	52	4.9
6	93	120	30	70	52	9.8	34	52	4.8
7	90	117	28	70	53	10	33	52	4.6
8	87	133	31	70	54	10	27	52	3.8
9	87	194	46	70	55	10	32	55	4.8
10	81	203	44	70	55	10	42	76	8.6
11	81	200	44	70	56	11	46	78	9.7
12	78	198	42	70	56	11	42	75	8.5
13	74	191	38	70	54	10	41	72	8.0
14	78	191	40	70	54	10	40	70	7.6
15	78	184	39	70	62	12	39	67	7.1
16	77	178	37	70	80	15	39	66	6.9
17	74	176	35	69	90	17	35	69	6.5
18	75	163	33	68	94	17	36	70	6.8
19	78	128	27	64	93	16	36	62	6.0
20	84	110	25	60	91	15	35	57	5.4
21	88	134	32	62	90	15	31	53	4.4
22	86	135	31	82	115	25	33	48	4.3
23	84	130	29	75	110	22	33	48	4.3
24	81	128	28	72	106	21	32	46	4.0
25	78	128	27	69	102	19	26	42	2.9
26	80	146	32	66	98	17	32	39	3.4
27	81	156	34	63	96	16	36	38	3.7
28	81	162	35	62	92	15	36	38	3.7
29	82	160	35	59	86	14	36	38	3.7
30	80	141	30	56	82	12	35	38	3.6
31	--	--	--	56	80	12	--	--	--
TOTAL	2536	--	1068	2122	--	437.6	1102	--	174.0

DAY	JULY			AUGUST			SEPTEMBER		
	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	27	37	2.7	54	60	8.7	47	68	8.6
2	25	36	2.4	53	59	8.4	212	8110	5540
3	30	45	3.6	50	58	7.8	116	2120	724
4	40	50	5.4	47	55	7.0	95	475	122
5	40	60	6.5	47	51	6.5	87	218	51
6	40	60	6.5	52	54	7.6	78	202	43
7	40	60	6.5	52	50	7.0	69	184	34
8	40	60	6.5	56	56	8.5	63	167	28
9	45	70	8.5	238	21400	14400	60	154	25
10	55	85	13	119	4810	1730	57	123	19
11	64	93	16	74	380	76	56	96	15
12	114	114	35	70	200	38	54	80	12
13	122	118	39	68	150	28	52	81	11
14	114	102	31	66	130	23	49	82	11
15	98	83	22	63	121	21	49	83	11
16	82	66	15	60	116	19	49	86	11
17	75	58	12	59	111	18	47	86	11
18	68	56	10	59	106	17	45	84	10
19	60	55	8.9	57	103	16	44	83	9.9
20	52	57	8.0	56	98	15	44	83	9.9
21	46	56	7.0	63	104	18	45	86	10
22	44	55	6.5	64	95	16	49	91	12
23	41	58	6.4	60	89	14	47	89	11
24	39	58	6.1	57	82	13	59	124	20
25	44	65	7.7	56	80	12	114	6430	2230
26	78	104	22	56	79	12	72	200	39
27	68	80	15	54	76	11	59	136	22
28	60	66	11	53	72	10	54	116	17
29	57	63	9.7	50	69	9.3	50	111	15
30	57	62	9.5	49	68	9.0	49	110	15
31	57	62	9.5	47	67	8.5	--	--	--
TOTAL	1822	--	368.9	2009	--	16595.3	1971	--	9097.4

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

18008.9

30401.81

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

[illegible]

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

[illegible]

## RED RIVER OF THE NORTH BASIN

05102490 RED RIVER OF THE NORTH NEAR PEMBINA, N. DAK.

LOCATION.--Lat 49°00'10", long 97°13'15", in NW¼SE¼ sec.2, T.1, R.2 E., at bridge on Manitoba Highway 75, 0.2 mi (0.3 km) downstream from international boundary, 3 mi (5 km) downstream from mouth of Pembina River.

DRAINAGE AREA.--40,200 mi<sup>2</sup> (104,100 km<sup>2</sup>), approximately - includes 3,800 mi<sup>2</sup> (9,800 km<sup>2</sup>) in closed basins.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1970 (monthly), October 1970 to current year (quarterly).

REMARKS.--Records of discharge are given for station 05102500, Red River of the North at Emerson, Manitoba.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LILITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L)
JAN. 11...	1230	1190	297	0	244	.23	.57	.48	.34
APR. 03...	1130	4200	211	--	173	1.4	.16	.45	.01
JUNE 28...	1230	1080	270	0	221	.51	.04	.29	.10
SEP. 27...	1100	2410	225	0	185	.41	.11	.25	.17

DATE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)
JAN. 11...	600	7.9	.0	-13.0	8.7	61	3.1
APR. 03...	500	7.9	4.0	8.0	7.2	56	7.4
JUNE 28...	1060	8.0	19.5	--	7.8	86	3.8
SEP. 27...	430	8.4	13.0	17.0	9.0	87	6.3



## 05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.

LOCATION.--Lat 48°22'20", long 101°30'18", in SW¼SE¼ sec.34, T.157 N., R.84 W., Ward County, on left bank 30 ft (9.1 m) upstream from county highway bridge, 3 mi (4.8 km) east of Foxholm, 19 mi (30.6 km) upstream from Des Lacs River, and at mile 414.5 (kilometre 666.9).

DRAINAGE AREA.--9,470 mi<sup>2</sup> (24,530 km<sup>2</sup>), approximately, of which about 6,200 mi<sup>2</sup> (16,100 km<sup>2</sup>) is probably non-contributing.

PERIOD OF RECORD.--Chemical analyses: October 1972 to current year.

Specific conductance: October 1972 to current year.

Water temperature: October 1972 to current year.

EXTREMES.--Current year:

Specific conductance: Maximum daily, 880 micromhos Sept. 15; minimum daily 598 micromhos Apr. 4.

Water temperature: Maximum daily, 25.0°C July 9, 1973; minimum daily, freezing point on many days during winter months.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
ONCE-DAILY MEASUREMENT

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	606	636	710	720	744	685	751	800	721	752	850
2	---	607	658	715	723	742	641	748	820	728	755	852
3	---	607	694	712	720	737	610	741	802	730	756	852
4	---	608	648	715	722	732	598	741	820	734	756	833
5	---	607	668	716	722	723	647	740	714	740	759	840
6	---	605	672	720	731	722	749	750	702	740	759	840
7	---	603	678	721	729	722	771	740	702	742	760	842
8	---	605	687	731	729	722	782	757	707	751	761	844
9	---	608	687	729	732	720	784	747	717	752	760	850
10	---	608	694	733	727	721	784	752	711	755	762	847
11	---	608	693	739	725	705	790	750	710	755	764	847
12	---	615	697	741	729	702	790	759	718	760	768	872
13	---	624	695	741	731	705	800	763	720	768	770	872
14	---	632	695	728	731	708	801	774	720	771	770	875
15	---	639	697	738	734	709	797	774	722	779	770	880
16	---	642	703	728	733	721	806	780	725	783	769	872
17	---	642	696	724	738	718	806	775	728	769	772	868
18	608	646	700	729	738	718	800	775	730	783	776	870
19	608	645	697	725	738	720	804	780	712	789	780	870
20	623	652	697	724	743	724	800	780	680	798	781	870
21	607	647	698	731	751	728	800	780	692	792	785	864
22	605	645	698	729	748	722	800	787	690	792	790	870
23	607	643	707	732	742	735	805	810	693	789	798	871
24	607	643	707	733	747	742	829	793	697	760	788	868
25	611	642	708	727	738	741	820	793	700	740	800	864
26	612	637	702	722	742	748	822	800	707	742	803	862
27	608	640	702	724	747	752	830	803	711	755	808	864
28	608	647	698	728	747	758	828	800	715	762	808	868
29	608	648	703	733	---	740	830	803	719	767	811	870
30	608	648	698	730	---	720	830	810	722	771	818	872
31	611	---	696	730	---	659	---	818	---	780	819	---
MONTH	---	628	691	727	734	725	775	773	724	761	778	861

## RED RIVER OF THE NORTH BASIN

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
ONCE-DAILY MEASUREMENT

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SI02) (MG/L)	TOTAL ALUM- INUM (AL) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
OCT.												
17...	1700	116	.9	150	160	60	120	40	48	22	51	.9
DEC.												
06...	1100	48	.9	--	--	40	--	390	45	25	64	12
JAN.												
09...	1430	51	2.8	60	220	50	320	300	48	27	69	11
FEB.												
28...	1730	47	3.0	--	--	40	--	520	47	27	68	12
APR.												
05...	0930	415	1.4	0	200	50	310	140	37	21	55	10
MAY												
03...	1145	1.3	3.1	--	--	20	--	160	43	27	73	11
31...	1100	.12	6.6	--	--	40	--	870	47	30	83	12
JUNE												
28...	1500	2.9	7.2	0	660	40	370	200	39	26	73	11
AUG.												
02...	1145	.46	3.9	--	--	30	--	70	39	30	86	12
30...	1100	3.4	--	--	--	--	--	--	--	--	--	--
SEP.												
13...	1045	102	10	--	--	50	--	20	46	33	92	14
27...	1000	.32	8.6	200	550	20	310	170	44	32	94	13

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)	ALKALINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLORIDE (CL) (MG/L)	DIS- SOLVED FLUORIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)
OCT. 17...	224	14	207	110	13	.3	.03	.05	--	--	.11	.00
DEC. 06...	267	0	219	120	14	.3	.04	.16	.94	1.1	.10	.02
JAN. 09...	292	0	240	130	16	.3	.07	.26	.94	1.2	.10	.06
FEB. 28...	296	0	243	130	15	.4	.04	.06	1.0	1.1	.10	.09
APR. 05...	230	0	189	100	13	.2	.00	.05	1.2	1.2	.13	.01
MAY 03...	294	0	241	130	16	.3	.02	.13	1.2	1.3	.11	.01
31...	321	0	263	140	17	.3	.00	.11	1.7	1.8	.13	.02
JUNE 28...	291	0	239	110	16	.4	.00	.03	.83	.86	.35	.20
AUG. 02...	261	29	262	130	20	.3	.00	.10	1.2	1.3	.46	.29
30...	--	--	--	--	--	--	--	--	--	--	--	--
SEP. 13...	370	0	303	140	22	.3	.01	.25	1.5	1.7	.47	.31
27...	359	0	294	130	24	.2	.02	.34	.96	1.3	.35	.21

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)
OCT. 17...	371	.50	116	210	3	34	1.5	615	8.7	4.0	-2.0	40
DEC. 06...	413	.56	53.5	220	0	38	1.9	700	8.0	.0	-18.0	20
JAN. 09...	449	.61	61.8	230	0	38	2.0	580	7.8	.0	-11.5	20
FEB. 28...	449	.61	57.0	230	0	38	2.0	730	8.5	2.5	-1.0	20
APR. 05...	351	.48	393	180	0	38	1.8	560	8.2	6.0	8.0	30
MAY 03...	449	.61	1.58	220	0	41	2.2	720	8.3	11.0	10.5	30
31...	495	.67	.16	240	0	41	2.3	775	8.4	19.5	20.0	30
JUNE 28...	427	.58	3.34	200	0	42	2.2	695	8.9	23.5	24.0	40
AUG. 02...	480	.65	.60	220	0	44	2.5	725	9.0	25.0	32.0	40
30...	--	--	--	--	--	--	--	815	8.4	21.0	24.0	--
SEP. 13...	541	.74	149	250	0	43	2.5	850	--	16.5	16.5	30
27...	524	.71	.45	240	0	44	2.6	840	--	12.5	15.0	30

DATE	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	CYANIDE (CN) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)	ALDRIN (UG/L)	ALDRIN IN BOTTOM DE- POSITS (UG/KG)	CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM DE- POSITS (UG/KG)
OCT. 17...	5	12.1	100	4.4	B 74000	86	.00	.0	.00	<.2	.0	<1
DEC. 06...	4	10.0	72	2.1	3300	<1	--	.0	--	--	--	--
JAN. 09...	3	8.4	61	1.4	8200	<1	.00	--	--	--	--	--
FEB. 28...	3	14.3	100	--	835	83	--	.0	--	--	--	--
APR. 05...	5	11.8	100	5.4	420	<1	.00	.0	.00	--	.0	--
MAY 03...	9	11.4	109	4.8	40	85	--	.0	--	--	--	--
31...	20	8.8	101	8.4	850	828	--	.0	--	--	--	--
JUNE 28...	10	10.2	125	5.2	864	815	.00	.0	--	--	--	--
AUG. 02...	4	7.2	91	2.1	25	24	--	.1	--	--	--	--
30...	--	5.2	61	2.7	100	78	--	--	--	--	--	--
SEP. 13...	5	--	--	--	--	--	--	.0	--	--	--	--
27...	10	6.9	68	4.1	828	840	.00	.0	--	--	--	--

B - Results based on colony count outside the acceptable range.

## RED RIVER OF THE NORTH BASIN

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DDD (UG/L)	DDD IN BOTTOM DE- POSITS (UG/KG)	DDE (UG/L)	DDE IN BOTTOM DE- POSITS (UG/KG)	DDT (UG/L)	DDT IN BOTTOM DE- POSITS (UG/KG)	DI- AZINON (UG/L)	DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM DE- POSITS (UG/KG)	ENDRIN (UG/L)	ENDRIN IN BOTTOM DE- POSITS (UG/KG)	HEPTA- CHLOR (UG/L)
OCT. 17...	.00	<.2	.00	<.2	.00	<.2	.02	.00	<.2	.00	<.2	.00
APR. 05...	.00	--	.00	--	.00	--	.03	.00	--	.00	--	.00

DATE	HEPTA- CHLOR IN BOTTOM DE- POSITS (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM DE- POSITS (UG/KG)	LINDANE (UG/L)	LINDANE IN BOTTOM DE- POSITS (UG/KG)	MALA- THION (UG/L)	DDD (UG/L)	PARA- THION (UG/L)	PCB (UG/L)	PCB IN BOTTOM DE- POSITS (UG/KG)	2,4-D (UG/L)	2,4-D IN BOTTOM DE- POSITS (UG/KG)
OCT. 17...	<.2	.00	<.2	.00	<.2	.00	.00	.00	.0	0	.00	<2
APR. 05...	--	.00	--	.00	--	.00	.00	.00	.0	--	.04	--

DATE	2,4,5-T (UG/L)	2,4,5-T IN BOTTOM DE- POSITS (UG/KG)	SILVEX (UG/L)	SILVEX IN BOTTOM DE- POSITS (UG/KG)	TOTAL ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL BERYL- LIUM (BE) (UG/L)	TOTAL BORON (B) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)
OCT. 17...	.00	<0	.00	<0	0	0	10	360	0	--	1	7
DEC. 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN. 09...	--	--	--	--	5	200	0	290	1	0	2	30
JAN. 10...	--	--	--	--	--	--	--	--	--	--	--	--
FEB. 28...	--	--	--	--	--	--	--	--	--	--	--	--
MAR. 12...	--	--	--	--	--	--	--	--	--	--	--	--
APR. 05...	.00	--	.00	--	4	0	0	300	<10	0	<20	10
MAY 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE 28...	--	--	--	--	10	0	0	280	10	10	<20	10
AUG. 02...	--	--	--	--	--	--	--	--	--	--	--	--
SEP. 27...	--	--	--	--	2	0	0	1200	<10	0	<25	10

DATE	TOTAL LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL MOLYB- DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL STRON- TIUM (SR) (UG/L)	TOTAL VANA- DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS- PEN- DED SEDI- MENT (MG/L)	SUS- PEN- DED SEDI- MENT DIS- CHARGE (T/DAY)
OCT. 17...	6	10	.4	2	13	6	10	150	42	50	20	6.3
DEC. 06...	--	--	--	--	--	--	--	--	--	--	18	2.3
JAN. 09...	3	30	.1	3	100	4	11	200	32	80	--	--
JAN. 10...	--	--	--	--	--	--	--	--	--	--	17	2.3
FEB. 28...	--	--	--	--	--	--	--	--	--	--	20	2.5
MAR. 12...	--	--	--	--	--	--	--	--	--	--	20	.10
APR. 05...	<100	20	.1	1	<25	0	<10	170	3.7	10	19	21
MAY 03...	--	--	--	--	--	--	--	--	--	--	24	.08
JUNE 28...	<50	30	.0	2	25	4	<10	170	1.9	60	34	.27
AUG. 02...	--	--	--	--	--	--	--	--	--	--	6	.01
SEP. 27...	<50	30	.1	1	25	10	<10	200	1.9	20	--	--

## RED RIVER OF THE NORTH BASIN

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05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

## PARTICLE-SIZE DISTRIBUTION OF BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	NUMBER OF SAM- PLING POINTS	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	BED MAT. FALL DIAM. % FINER THAN 1.00 MM
OCT. 17...	1700	20	6	12	19	27	34

DATE	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	BED MAT. SIEVE DIAM. % FINER THAN 64.0 MM
OCT. 17...	39	45	51	62	75	83

## BIOLOGICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

On Oct. 17, 1972 a biological survey was conducted on the aquatic environment in the area between the gage and the control 400 ft (122 m) downstream.

## MACROPHYTES

IDENTIFICATION	COMMON NAME	LOCATION
<u>Potamogeton Richardsonii</u>	Richardson Pondweed	Left edge of water 50 ft (15 m) upstream from control.
<u>Plantago major</u>	Plantain	At control.
<u>Glyceria grandis</u>	Manna Grass	Right edge of water 50 ft (15 m) upstream from control.

## PERIPHYTON

3-CODOMINANT GENERA	ALGAL GROUP	LOCATION
<u>Rhoicosphenia curvata</u>	Diatom	Left edge of water 60 ft (18 m) upstream from control.
<u>Cymbella</u>	Diatom	
<u>Synedra</u>	Diatom	
<u>Fragilarici</u>	Diatom	Left edge of water on grass.
<u>Synedra</u>	Diatom	
<u>Cocconeis</u>	Diatom	
<u>Cladophora</u>	Green	On control (pooled water).
<u>Melosira</u>	Diatom	
<u>Fragilaria</u>	Diatom	
<u>Rhizoclonium</u>	Green	Right edge of water on rock.
<u>Fragilaria</u>	Diatom	
<u>Synedra</u>	Diatom	
<u>Rhizoclonium</u>	Green	Left edge of water from rock upstream from control.
<u>Fragilaria</u>	Diatom	
<u>Eunoita</u>	Diatom	
<u>Cladophora</u>	Diatom	Left edge of water on control (fast water).
<u>Anabaena</u>	Blue-green	
<u>Diatoma</u>	Diatom	



## RED RIVER OF THE NORTH BASIN

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

BIOLOGICAL ANALYSES AND DISSOLVED OXYGEN PROFILE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

## TWENTY-FOUR HOUR DISSOLVED OXYGEN PROFILE

HOURL	MG/L	HOURL	MG/L	HOURL	MG/L	HOURL	MG/L
Oct. 17, 1972		Oct. 18, 1972		2000	14.6	1000	12.5
1000	11.4	0100	11.8	2100	14.7	1100	12.5
1100	11.4	0200	11.6	2200	14.8	1200	12.7
1200	11.7	0300	11.7	2300	14.7	1300	13.0
1400	11.8	0400	11.7	2400	14.6	1400	13.2
1500	12.0	0500	12.0			1500	13.6
1600	12.1	0930	11.9	March 1, 1973		1600	14.0
1700	12.0	1100	12.1	0100	14.6	1700	14.2
1800	12.1	1130	12.1	0200	14.4		
1900	12.1	1200	12.2	0300	14.3	July 9, 1973	
2000	12.0			0400	14.0	1600	9.5
2100	12.0	Feb. 28, 1873		0500	13.6	2400	6.4
2200	12.0	1700	14.2	0600	13.4		
2300	11.9	1800	14.4	0700	13.4	July 10, 1973	
		1900	14.6	0800	13.0	0700	4.0
				0900	12.8	1600	8.0

## PHYTOPLANKTON

DATE	TOTAL COUNT CELLS/ML	PERCENT COMPOSITION	3-CODOMINANT GENERA	ALGAL GROUP
721017	1,300	21 40	<u>Anabaena</u> <u>Stephanodiscus</u>	Diatom Diatom
721206	5,300	53 36	<u>Stephanodiscus</u> <u>Fragilaria</u>	Diatom Diatom
730110	1,500	25 50 25	<u>Gymnodinium</u> <u>Stephanodiscus</u> <u>Synedra</u>	Flagellate Diatom Diatom
730228	8,000	59 18 15	<u>Cyclotella</u> <u>Chlamydomonas</u> <u>Tabellaria</u>	Diatom Flagellate Diatom
730405	1,900	23 16 15	<u>Chlamydomonas</u> <u>Dinobryon</u> <u>Ankistrodesmus</u>	Flagellate Flagellate Green
730503	330	26	<u>Nitzschia</u>	Diatom
730531	110,000	31 15 15	<u>Aphanizomenom</u> <u>Kirchneriella</u> <u>Scenedesmus</u>	Blue-green Green Green
730728	96,000	52 15 15	<u>Aphanizomenom</u> <u>Scenedesmus</u> <u>Cyclotella</u>	Blue-green Green Diatom
730802	30,000	20 15	<u>Scenedesmus</u> <u>Nitzschia</u>	Green Diatom
730830	18,000	29 24	<u>Cryptomonas</u> <u>Scenedesmus</u>	Flagellate Green
730927	39,000	32 27	<u>Cryptomonas</u> <u>Scenedesmus</u>	Flagellate Green

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, N. DAK.--Continued

BIOLOGICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

## PERIPHYTON

Collected by plastic strip samplers, placed approximately one month prior to collection date at 3 points in the stream: Site 1 - on pier downstream side of bridge approximately 20 ft (6 m) from left edge of water; site 2 - right or left edge of water upstream from control approximately 20 ft (6 m) from bank; site 3 - right edge of water downstream from control approximately 10 ft (3 m) from bank.

## BIOMASS

DATE	SITE	DRY WEIGHT G/M <sup>2</sup>	ASH WEIGHT G/M <sup>2</sup>	3-CODOMINANT GENERA	ALGAL GROUP
721017	1	0	0	<u>Fragilaria</u> <u>Ulothrix</u>	Diatom Green
730110	2	1.7	0.8	<u>Fragilaria</u> <u>Synedra</u>	Diatom Diatom
730110	2	5.8	4.2	<u>Fragilaria</u> <u>Diatoma</u> <u>Vauchera</u>	Diatom Diatom Green
730110	3	14	3.3	<u>Fragilaria</u> <u>Stigeoclonium</u> <u>Diatoma</u> <u>Gomphonema</u>	Diatom Green Diatom Diatom
730228	3	3.3	0.8	<u>Fragilaria</u> <u>Gomphonema</u> <u>Diatoma</u>	Diatom Diatom Diatom
730228	3	9.2	7.5	<u>Fragilaria</u> <u>Gomphonema</u> <u>Diatoma</u>	Diatom Diatom Diatom
730411	2	5.0	1.7	<u>Fragilaria</u> <u>Vauchera</u> <u>Spirogyra</u>	Diatom Green Green
730530	2	74	42	<u>Spirogyra</u> <u>Fragilaria</u>	Green Diatom
730503	3	1.7	0	<u>Spirogyra</u> <u>Fragilaria</u>	Green Diatom
730628	2	28	9.2	<u>Cocconeis</u>	Diatom
730830	2	66	15	<u>Cocconeis</u>	Diatom
730830	1	19	9.2	<u>Epithemia</u> <u>Lyngbya</u>	Diatom Blue-green

## BENTHIC INVERTEBRATES

Collected by multi-plate sampler, placed approximately 1 month prior to collection date at 3 points in the stream: Site 1 - on pier downstream side of bridge approximately 20 ft (6 m) from left edge of water; site 2 - right or left edge of water upstream from control approximately 20 ft (6 m) from bank; site 3 - right edge of water downstream from control approximately 10 ft (3 m) from bank.

DATE	SITE	BIOMASS G/M <sup>2</sup>	IDENTIFICATION AND COUNT	COMMON NAME
730110	2	0.1	Pelecypoda - 1 Isopoda - 1 Trichoptera - 1	Clams (Mollusk) Sow bugs (Crustacean) Caddisflies (Insect)
730110	2	.1	Trichoptera - 1 Pelecypoda - 1	Caddisflies (Insect) Clams (Mollusk)
730110	2	.1	Amphipoda - 2 Diptera (Chironomidae) - 10	(Crustacean) Flies and midges (Insect)
730802	Unknown	.1	Ephemeroptera - 17 Trichoptera - 1 Diptera (Chironomidae) - 1	Mayflies (Insect) Caddisflies (Insect) Flies and midges (Insect)
730830	2	.3	Ephemeroptera - 7 Odonata - 1 Trichoptera - 1 Gastropoda - 1	Flies and midges (Insect) Dragonflies and damselflies (Insect) Caddisflies (Insect) Snails (Mollusk)

## RED RIVER OF THE NORTH BASIN

05120000 SOURIS (MOUSE) RIVER NEAR VERENDRYE, N. DAK.

LOCATION.--Lat 48°09'35", long 100°43'45", in NW¼SW¼ sec.17, T.154 N., R.78 W., McHenry County, at gaging station, 2.7 mi (4.3 km) north of Verendrye, 19 mi (31 km) upstream from mouth of Wintering River, and at mile 302.0 (kilometre 485.9).

DRAINAGE AREA.--11,300 mi<sup>2</sup> (29,300 km<sup>2</sup>), approximately, of which about 6,900 mi<sup>2</sup> (17,900 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: October 1949 to August 1951, August 1952 to current year.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
NOV.												
01...	1500	147	1.5	--	--	--	50	28	88	11	302	0
30...	1130	56	5.4	--	--	--	69	35	110	11	382	0
JAN.												
11...	1600	63	8.4	--	--	--	67	35	120	16	408	0
FEB.												
28...	1100	91	7.2	--	--	--	55	27	84	14	297	0
APR.												
04...	1150	58	9.7	10	80	230	54	26	81	9.3	275	0
MAY												
02...	1500	52	3.9	--	--	--	68	36	130	9.4	391	0
30...	1515	23	5.8	--	--	--	81	44	140	8.1	473	0
JUNE												
28...	0900	116	13	--	--	--	65	38	85	11	229	0
AUG.												
01...	1540	18	14	--	--	--	78	42	120	11	423	0
29...	1715	12	--	--	--	--	--	--	--	--	--	--
SEP.												
26...	1615	24	13	0	30	30	57	37	150	13	357	0

DATE	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)
NOV.											
01...	248	180	15	.3	.00	.04	.10	.03	.03	544	.74
30...	313	220	22	.4	.04	.16	.11	.03	.03	704	.96
JAN.											
11...	335	210	41	.5	.12	3.2	1.8	1.5	1.3	780	1.06
FEB.											
28...	244	180	26	.5	.37	.33	.28	.22	.19	516	.70
APR.											
04...	226	170	18	.1	.54	.19	.25	.11	.08	559	.76
MAY											
02...	321	230	28	.3	.01	.12	.15	.14	.08	722	.98
30...	388	250	30	.4	.02	.18	.33	.23	.20	860	1.17
JUNE											
28...	188	290	13	.4	.49	.27	.23	.17	.11	689	.94
AUG.											
01...	347	270	31	.3	.03	.07	.31	.11	.11	801	1.09
29...	--	--	--	--	--	--	--	--	--	--	--
SEP.											
26...	293	260	48	.4	.24	.77	1.2	1.0	.86	804	1.09

## 05120000 SOURIS (MOUSE) RIVER NEAR VERENDRYE, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	DIS- SOLVED OXYGEN (MG/L)
NOV.											
01...	216	240	0	43	2.5	830	8.2	.5	4.0	40	12.3
30...	106	320	3	42	2.7	1090	7.5	.5	-3.0	20	11.2
JAN.											
11...	133	310	0	44	3.0	1100	7.3	.0	-7.5	30	.3
FEB.											
28...	127	250	5	41	2.3	820	7.6	.0	2.5	50	4.5
APR.											
04...	87.5	240	17	41	2.3	800	8.0	3.0	13.0	30	12.2
MAY											
02...	101	320	0	46	3.2	1050	8.2	9.5	13.5	20	11.6
30...	53.4	380	0	44	3.1	1220	8.0	18.5	24.0	30	9.2
JUNE											
28...	216	320	130	36	2.1	925	7.7	19.5	17.0	40	4.8
AUG.											
01...	38.9	370	21	41	2.7	1130	8.3	24.5	29.5	30	11.0
29...	--	--	--	--	--	1110	8.4	22.0	30.0	--	10.0
SEP.											
26...	52.1	300	2	51	3.8	1210	--	11.5	17.0	30	9.2

DATE	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)	FECAL COLI- FORM (CUL. PER 100 ML)	CYANIDE (CN) (MG/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)
NOV.											
01...	110	6.4	B15	--	--	--	--	--	--	--	--
30...	82	2.9	50	--	--	--	--	--	--	--	--
JAN.											
11...	?	8.1	B2500	--	--	--	--	--	--	--	--
FEB.											
28...	32	3.0	50	--	--	--	--	--	--	--	--
APR.											
04...	95	4.0	B5	.01	2	400	0	130	0	0	2
MAY											
02...	107	1.3	B4	--	--	--	--	--	--	--	--
30...	103	3.7	B1	--	--	--	--	--	--	--	--
JUNE											
28...	55	3.3	B8	--	--	--	--	--	--	--	--
AUG.											
01...	140	8.4	B12	--	--	--	--	--	--	--	--
29...	120	>11	45	--	--	--	--	--	--	--	--
SEP.											
26...	89	6.7	B0	.01	10	100	0	300	0	0	0

DATE	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
NOV.											
01...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
JAN.											
11...	--	--	--	--	--	--	--	--	--	--	--
FEB.											
28...	--	--	--	--	--	--	--	--	--	--	--
APR.											
04...	<10	0	30	.7	2	5	10	1	270	.0	20
MAY											
02...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
JUNE											
28...	--	--	--	--	--	--	--	--	--	--	--
AUG.											
01...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
SEP.											
26...	3	0	50	.0	3	7	9	0	370	4.0	10

B - Results based on colony count outside the acceptable range.

## RED RIVER OF THE NORTH BASIN

05124000 SOURIS (MOUSE) RIVER NEAR WESTHOPE, N. DAK.  
(Radiochemical station)

LOCATION.--Lat 48°59'47", long 100°57'29", in SW¼SE¼ sec.30, T.164 N., R.79 W., Bottineau County, at gaging station, 1,200 ft (366 m) upstream from second crossing of international boundary, 1 mi (1.6 km) downstream from Fish and Wildlife Service Dam 357, 7 mi (11 km) northeast of Westhope, 11 mi (17.7 km) downstream from Boundary Creek, and at mile 154.5 (kilometre 248.6).

DRAINAGE AREA.--16,900 mi<sup>2</sup> (43,800 km<sup>2</sup>), approximately, of which 10,300 mi<sup>2</sup> (26,700 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: June 1954 to September 1964, October 1966 to current year.

Water temperatures: October 1954 to September 1955, October 1956 to September 1959, October 1960 to September 1964, October 1966 to September 1968.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
NOV.												
02...	1130	242	3.2	--	--	--	55	40	100	6.0	409	0
29...	1620	75	6.7	--	--	--	65	41	120	15	431	0
JAN.												
12...	1230	17	16	--	--	--	160	97	260	32	1060	0
MAR.												
01...	1400	48	10	--	--	--	91	53	170	18	600	0
APR.												
04...	1700	40	2.1	0	40	250	53	30	86	12	334	0
MAY												
08...	1545	22	3.2	--	--	--	36	20	56	8.9	234	0
JUNE												
05...	1230	43	2.6	--	--	--	52	30	86	11	346	0
JULY												
03...	1700	83	4.6	--	--	--	44	33	92	13	308	17
AUG.												
07...	1445	26	18	--	--	--	36	38	110	14	388	0
SEP.												
06...	1600	23	--	--	--	--	--	--	--	--	--	--

DATE	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	DIS- SOLVED SOLIDS PER AC-FT)
NOV.												
02...	335	170	20	.4	.00	.06	.02	.02	.01	696	720	.95
29...	354	220	24	.3	.01	.05	.12	.09	.06	712	740	.97
JAN.												
12...	869	450	55	.6	.02	.06	.20	.14	.11	1850	1700	2.52
MAR.												
01...	492	290	59	.5	.06	1.5	1.3	.96	.81	1000	1000	1.36
APR.												
04...	274	140	30	.3	.02	.14	.42	.24	.18	570	600	.78
MAY												
08...	192	91	16	.2	.03	.05	.14	.05	.01	370	370	.50
JUNE												
05...	284	140	21	.3	.02	.38	.17	.02	.01	567	520	.77
JULY												
03...	281	130	23	.5	.00	1.1	.34	.10	.03	563	670	.77
AUG.												
07...	318	170	27	.3	.05	.52	.47	.17	.17	712	650	.97
SEP.												
06...	--	--	--	--	--	--	--	--	--	--	790	--

DATE	DIS- SOLVED SOLIDS (TNS PER DAY)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)
NOV.											
02...	455	6	300	0	41	2.5	970	8.6	2.0	-5.0	50
29...	144	2	330	0	43	2.9	1200	7.5	1.0	.5	30
JAN.											
12...	84.9	4	800	0	40	4.0	2400	7.2	.0	-.5	60
MAR.											
01...	130	12	450	0	44	3.5	1500	7.7	.0	4.0	40
APR.											
04...	.62	59	260	0	41	2.3	835	8.5	8.5	13.5	30
MAY											
08...	22.4	15	170	0	40	1.9	563	8.4	15.5	20.5	40
JUNE											
05...	65.8	48	250	0	41	2.4	815	8.2	14.0	18.5	40
JULY											
03...	126	32	250	0	43	2.6	815	9.0	20.0	29.5	40
AUG.											
07...	50.0	34	250	0	48	3.1	920	9.0	21.0	22.5	30
SEP.											
06...	--	50	--	--	--	--	1040	8.1	--	24.0	--



05124000 SOURIS (MOUSE) RIVER NEAR WESTHOPE, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L)	CYANIDE (MG/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)
NOV.											
02...	15.8	120	8.0	--	--	--	--	--	--	--	--
29...	12.0	89	--	--	--	--	--	--	--	--	--
JAN.											
12...	5.8	42	--	--	--	--	--	--	--	--	--
MAR.											
01...	15.8	110	--	--	--	--	--	--	--	--	--
APR.											
04...	13.6	121	--	.00	3	0	0	170	0	0	2
MAY											
08...	11.5	120	--	--	--	--	--	--	--	--	--
JUNE											
05...	7.3	74	--	--	--	--	--	--	--	--	--
JULY											
03...	13.1	150	--	--	--	--	--	--	--	--	--
AUG.											
07...	6.6	77	--	--	--	--	--	--	--	--	--
SEP.											
06...	5.6	65	--	--	--	--	--	--	--	--	--

DATE	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
NOV.											
02...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
JAN.											
12...	--	--	--	--	--	--	--	--	--	--	--
MAR.											
01...	--	--	--	--	--	--	--	--	--	--	--
APR.											
04...	12	0	30	.0	1	14	10	1	200	.0	0
MAY											
08...	--	--	--	--	--	--	--	--	--	--	--
JUNE											
05...	--	--	--	--	--	--	--	--	--	--	--
JULY											
03...	--	--	--	--	--	--	--	--	--	--	--
AUG.											
07...	--	--	--	--	--	--	--	--	--	--	--
SEP.											
06...	--	--	--	--	--	--	--	--	--	--	--

DATE	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENDED GROSS BETA AS CS-137 (PC/L)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L)	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)
NOV.								
02...	<6.2	.5	26	1.1	23	1.0	.12	2.2
29...	<8.3	<.4	26	.8	21	.7	.08	1.9
JAN.								
12...	<17	<.4	60	1.4	50	1.3	.13	4.0
MAR.								
01...	<11	.8	32	1.9	26	1.7	.04	2.3
APR.								
04...	<6.7	3.6	19	3.0	16	2.5	.06	1.2
MAY								
08...	6.2	.6	17	2.1	14	1.9	.06	1.0
JUNE								
05...	<8.6	3.2	18	3.4	14	3.0	.09	1.6
JULY								
03...	<7.7	1.7	26	3.3	22	2.9	.05	1.4
AUG.								
07...	12	1.2	24	2.5	19	2.2	.06	1.0
SEP.								
06...	<11	<1.8	24	<2.8	20	<2.5	.10	1.2

## PART 6. MISSOURI RIVER BASIN

## LITTLE MUDDY CREEK BASIN

06331000 LITTLE MUDDY CREEK BELOW COW CREEK NEAR WILLISTON, N. DAK.

LOCATION.--Lat 48°17'04", long 103°34'21", in NE¼NW¼ sec. 5, T. 155 N., R.100 W., Williams County, at gaging station on left bank 37 ft (11 m) downstream from centerline of highway, 1.5 mi (2.4 km) downstream from Cow Creek, 4 mi (6 km) upstream from Camp Creek, 10 mi (16 km) northeast of Williston, and 13 mi (21 km) upstream from mouth.

DRAINAGE AREA.--875 mi<sup>2</sup> (2,266 km<sup>2</sup>), approximately, of which about 100 mi<sup>2</sup> (259 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--October 1972 to September 1973 (discontinued).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO <sub>3</sub> ) (MG/L)
NOV. 08...	1500	20	16	850	160	80	74	310	7.9	753
DEC. 08...	1145	7.4	22	780	240	100	89	360	8.4	905
JAN. 12...	1145	9.4	28	--	300	110	91	360	7.9	901
FEB. 07...	1530	13	20	850	40	96	78	330	8.1	741
28...	1430	21	17	850	0	71	62	280	14	700
APR. 05...	1315	24	8.1	850	50	66	61	250	7.5	605
MAY 01...	1515	39	8.7	850	20	80	78	390	13	754
JUNE 07...	0925	36	15	--	30	64	89	400	9.1	731
JULY 04...	1120	6.4	13	--	10	56	80	380	8.9	728
AUG. 01...	1335	4.9	14	--	20	57	65	380	8.6	705
SEP. 06...	1120	25	13	80	40	61	60	330	8.5	628

DATE	CARBONATE (CO <sub>3</sub> ) (MG/L)	ALKALINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHO-PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)
NOV. 08...	0	618	530	8.0	.3	.23	.02	1410	1.92	76.2
DEC. 08...	0	742	600	9.2	.4	.23	.02	1710	2.33	34.2
JAN. 12...	0	739	650	13	.5	.41	.00	1690	2.30	42.9
FEB. 07...	0	608	580	89	.6	.56	.01	1470	2.00	51.6
28...	0	574	450	8.4	.5	.56	.01	1240	1.69	70.3
APR. 05...	0	496	460	7.8	.3	.23	.00	1160	1.58	75.2
MAY 01...	0	618	760	9.9	.2	.23	.01	1720	2.34	181
JUNE 07...	11	618	710	6.6	.2	.23	.06	1650	2.24	160
JULY 04...	3	602	680	7.8	.4	.23	.04	1540	2.10	26.6
AUG. 01...	0	578	650	8.8	.7	.23	.02	1540	2.10	20.4
SEP. 06...	0	515	570	8.4	.9	.23	.01	1330	1.81	89.8

DATE	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS-SOLVED BORON (B) (UG/L)
NOV. 08...	500	0	57	6.0	2040	8.0	2.0	12	470
DEC. 08...	620	0	56	6.3	2360	7.9	.0	18	560
JAN. 12...	650	0	54	6.1	2360	7.8	.0	23	130
FEB. 07...	560	0	56	6.1	2170	8.0	.0	12	130
28...	430	0	58	5.9	1800	8.0	1.0	11	40
APR. 05...	420	0	56	5.3	1690	8.1	7.5	7.7	0
MAY 01...	520	0	61	7.4	2400	8.2	10.0	7.6	430
JUNE 07...	530	0	62	7.6	2300	8.4	17.0	4.8	220
JULY 04...	470	0	63	7.6	2190	8.3	21.0	5.9	220
AUG. 01...	410	0	66	8.2	2180	8.1	24.0	9.0	90
SEP. 06...	400	0	64	7.2	1945	8.1	15.5	8.0	170

06332515 BEAR DEN CREEK NEAR MANDAREE, N. DAK.  
(Hydrologic bench-mark station)

LOCATION.--Lat 47°47'14", long 102°46'05", in NW¼ sec.30, T.150 N., R.94 W., McKenzie County, at gaging station 0.5 mi (0.8 km) upstream from county highway culvert and 5.5 mi (8.8 km) northwest of Mandaree.

DRAINAGE AREA.--74 mi<sup>2</sup> (192 km<sup>2</sup>).PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.  
Water temperatures: August 1969 to September 1970.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
OCT.											
31...	1200	.39	14	--	60	60	41	26	660	5.6	953
NOV.											
28...	1200	.40	16	--	100	160	49	29	700	6.0	1100
MAR.											
13...	1200	9.1	7.3	50	330	110	23	11	110	8.8	189
APR.											
05...	1300	.76	8.9	--	100	60	47	26	470	6.9	726
MAY											
03...	1300	.66	8.8	--	70	40	54	32	560	6.6	482
30...	1110	.63	6.3	--	70	20	36	24	650	5.8	765
JUNE											
26...	1430	.27	5.8	--	110	10	38	26	510	7.8	636
JULY											
31...	1300	.19	2.3	--	90	0	17	25	660	6.9	850
AUG.											
28...	1155	.17	5.3	--	0	8	17	23	680	7.4	865
SEP.											
25...	1225	4.7	8.0	--	190	30	25	12	350	8.2	393

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)
OCT.											
31...	60	882	710	7.0	.5	.04	.01	2030	2.76	2.14	210
NOV.											
28...	0	902	850	5.6	.4	.02	.14	2560	3.48	2.76	240
MAR.											
13...	0	155	190	7.6	.3	.54	.13	496	.67	12.2	100
APR.											
05...	0	595	610	5.1	.4	.04	.03	1640	2.23	3.37	220
MAY											
03...	173	683	850	5.1	.5	.04	.02	2010	2.73	3.58	270
30...	80	761	790	4.8	.5	.04	.02	2010	2.73	3.42	190
JUNE											
26...	0	522	800	4.9	.6	.04	.00	1750	2.38	1.28	200
JULY											
31...	70	814	750	4.8	.5	.03	.03	2020	2.75	1.04	150
AUG.											
28...	80	843	750	4.0	.5	.07	.01	2080	2.83	.95	140
SEP.											
25...	0	322	500	5.3	.5	.15	.88	1160	1.58	14.8	110

DATE	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	AIR TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION
OCT.										
31...	0	87	20	2870	8.7	1.5	-6.0	40	12.8	100
NOV.										
28...	0	86	20	3150	8.1	.0	-9.0	90	12.1	89
MAR.										
13...	0	68	4.7	695	7.9	.0	3.0	200	12.6	93
APR.										
05...	0	81	14	2150	8.2	7.5	8.5	80	12.2	109
MAY										
03...	0	82	15	2620	8.4	12.0	15.0	90	10.6	105
30...	0	88	21	2700	8.6	17.5	19.5	90	9.4	105
JUNE										
26...	0	84	16	2330	8.3	22.5	23.5	100	9.7	120
JULY										
31...	0	90	24	2740	8.8	24.0	27.0	50	10.4	130
AUG.										
28...	0	91	25	2730	8.8	23.0	24.0	90	10.6	130
SEP.										
25...	0	86	14	1690	7.8	13.0	18.5	200	9.6	97

## BEAR DEN CREEK BASIN

06332515 BEAR DEN CREEK NEAR MANDAREE, N. DAK.--Continued

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	BIO-CHEMICAL OXYGEN DEMAND (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	CYANIDE (CN) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)
OCT. 31...	3.7	B100	--	--	--	--	--	--	--	--
NOV. 28...	.8	B7	--	--	--	--	--	--	--	--
MAR. 13...	6.4	B130	.00	2	0	140	0	0	0	10
APR. 05...	3.5	500	--	--	--	--	--	--	--	--
MAY 03...	2.4	B110	--	--	--	--	--	--	--	--
30...	3.1	B26	--	--	--	--	--	--	--	--
JUNE 26...	2.8	B250	--	--	--	--	--	--	--	--
JULY 31...	2.1	B66	--	--	--	--	--	--	--	--
AUG. 28...	1.0	B510	--	--	--	--	--	--	--	--
SEP. 25...	5.8	5700	--	--	--	--	--	--	--	--

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR. 13...	1	10	.0	0	8	3	1	180	2.0	20

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AND BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPERATURE (DEG C)	NUMBER OF SAMPLING POINTS	DIS-CHARGE (CFS)	SUS-PENDED SEDIMENT (MG/L)	SUS-PENDED SEDIMENT 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	BED MAT. FALL DIAM. % FINER THAN .004 MM	BED MAT. FALL DIAM. % FINER THAN .062 MM
OCT. 31...	1200	1.5	8	.39	310	.33	--	--	--	--	8
NOV. 28...	1200	.0	5	.40	400	.43	--	--	--	--	8
APR. 05...	1300	7.5	4	.76	172	.35	--	--	--	--	9
MAY 03...	1300	12.0	11	.66	155	.28	--	--	--	--	--
30...	1110	17.5	10	.63	292	.50	--	--	--	--	9
JUNE 26...	1430	22.5	10	.27	328	.24	--	--	--	--	11
JULY 31...	1300	24.0	5	.19	490	.25	--	--	--	6	17
AUG. 28...	1155	23.0	8	.17	152	.07	--	--	--	5	19
SEP. 25...	1225	13.0	--	4.7	1610	20	90	99	100	6	29

DATE	BED MAT. FALL DIAM. % FINER THAN .125 MM	BED MAT. FALL DIAM. % FINER THAN .250 MM	BED MAT. FALL DIAM. % FINER THAN .500 MM	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	BED MAT. SIEVE DIAM. % FINER THAN 64.0 MM
OCT. 31...	12	22	29	39	50	63	80	94	100	--
NOV. 28...	12	23	34	45	55	68	80	92	100	--
APR. 05...	14	25	33	41	49	59	71	88	100	--
MAY 03...	--	--	--	--	--	--	--	--	--	--
30...	12	22	30	38	47	58	67	84	100	--
JUNE 26...	17	26	33	40	49	61	72	85	100	--
JULY 31...	19	22	24	28	33	40	48	59	100	--
AUG. 28...	22	32	38	47	55	66	77	95	100	--
SEP. 25...	38	51	59	69	72	77	81	86	94	100

B - Results based on colony count outside the acceptable range.

## LITTLE MISSOURI RIVER BASIN

79

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.

LOCATION.--Lat 47°35'25", long 103°15'05", in NW4SE4SE4 sec.35, T.148 N., R.99 W., McKenzie County, at bridge on U.S. Highway 85, 17 mi (27 km) upstream from Cherry Creek, and 17.5 mi (28.2 km) south of Watford City.

DRAINAGE AREA.--8,310 mi<sup>2</sup> (21,520 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: Water years 1946-49 (partial-record station), October 1971 to September 1972 (monthly).

Specific conductance: July 1972 to current year (weekly).

Water temperature: July 1972 to current year (weekly).

Sediment records: October 1948 to current year.

EXTREMES.--Current year:

Sediment concentration: Maximum daily, 41,000 mg/l Sept. 4; minimum daily 35 mg/l Aug. 29.

Sediment discharge: Maximum daily 203,000 tons Sept. 4; minimum daily 1.6 tons Aug. 29 and 31.

Period of record:

Sediment concentration (1972-73): Maximum daily, 41,000 mg/l Sept. 4, 1973; minimum daily, 35 mg/l Aug. 29, 1973.

Sediment discharge (1972-73): Maximum daily, 528,000 tons Mar. 17, 1972; minimum daily, 1.6 tons Aug. 29 and 31, 1973.

REMARKS.--Sediment records from October 1948 to September 1971 are available from U.S. Corps of Engineers, Omaha, Neb.

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AND BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPER- ATURE (DEG C)	NUMBER OF SAM- PLING POINTS	DIS- CHARGE (CFS)	SUS- PEN- DED SEDI- MENT (MG/L)	SUS- PEN- DED SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	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
NOV.											
01...	1410	3.0	18	61	312	51	--	--	--	--	--
29...	1305	.0	16	39	200	21	--	--	--	--	--
JAN.											
16...	1415	1.0	11	12	206	7.0	--	--	--	--	--
MAR.											
23...	1655	3.0	17	468	1050	1330	53	64	86	88	93
APR.											
25...	1430	11.0	9	1430	18800	72600	72	80	93	97	99
MAY											
24...	1400	16.0	19	150	147	60	--	--	--	--	--
JUNE											
28...	1345	23.5	10	2020	9880	53900	56	68	82	97	99
AUG.											
01...	1205	27.0	24	135	401	146	--	--	--	--	--
29...	1250	23.0	22	24	82	5.0	--	78	99	100	--
SEP.											
27...	1120	15.0	25	141	5000	1900	--	94	97	100	--

DATE	SUS. SED. FALL DIAM. % FINER THAN .250 MM	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	BED MAT. FALL DIAM. % FINER THAN 1.00 MM	BED MAT. FALL DIAM. % FINER THAN 2.00 MM	BED MAT. FALL DIAM. % FINER THAN 4.00 MM	BED MAT. FALL DIAM. % FINER THAN 8.00 MM	BED MAT. FALL DIAM. % FINER THAN 16.0 MM	BED MAT. FALL DIAM. % FINER THAN 32.0 MM
NOV.											
01...	--	3	11	61	87	93	95	97	99	100	--
29...	--	3	8	51	86	94	96	98	99	100	--
JAN.											
16...	--	6	11	45	81	92	96	98	98	99	100
MAR.											
23...	100	1	14	64	83	90	93	96	98	100	--
APR.											
25...	100	0	5	61	84	95	98	100	--	--	--
MAY											
24...	--	1	4	29	75	90	95	98	99	100	--
JUNE											
28...	100	2	9	60	96	97	98	98	100	--	--
AUG.											
01...	--	9	31	79	94	99	99	100	--	--	--
29...	--	8	18	76	94	99	100	--	--	--	--
SEP.											
27...	--	4	5	35	74	92	94	96	97	99	100



## LITTLE MISSOURI RIVER BASIN

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	97	650	170	66	300	53	40	200	22
2	72	440	86	80	250	54	35	200	19
3	72	410	80	90	560	136	30	200	16
4	80	450	97	90	570	139	25	200	14
5	106	490	140	100	620	167	25	200	14
6	93	250	63	103	460	128	24	200	13
7	87	260	61	106	380	109	18	200	9.7
8	87	320	75	110	390	116	14	200	7.6
9	90	550	134	110	380	113	11	200	5.9
10	110	860	255	110	460	137	10	200	5.4
11	110	1860	634	93	420	105	10	200	5.4
12	172	6670	3110	90	400	97	10	200	5.4
13	159	2390	1050	80	350	76	10	200	5.4
14	142	780	299	50	300	41	10	200	5.4
15	134	1280	463	35	250	24	10	200	5.4
16	134	4560	1650	37	200	20	10	200	5.4
17	129	5400	1880	40	200	22	10	200	5.4
18	110	3750	1110	40	200	22	10	200	5.4
19	100	2410	651	40	200	22	10	200	5.4
20	80	1250	270	40	200	22	10	200	5.4
21	72	510	99	45	200	24	10	200	5.4
22	69	460	86	45	200	24	10	200	5.4
23	66	580	103	45	200	24	10	200	5.4
24	66	800	143	45	200	24	11	200	5.9
25	63	730	124	50	200	27	11	200	5.9
26	55	400	59	50	200	27	11	200	5.9
27	58	340	53	45	200	24	11	200	5.9
28	60	570	92	45	200	24	11	200	5.9
29	63	400	68	40	200	22	11	200	5.9
30	80	420	91	40	200	22	11	200	5.9
31	100	580	157	--	--	--	11	200	5.9
TOTAL	2916	--	13353	1960	--	1845	450	--	244.0

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	11	200	5.9	350	150	142	7230	5000	97600
2	11	200	5.9	450	150	182	6480	4000	70000
3	11	200	5.9	600	150	243	6000	3300	53500
4	11	200	5.9	500	150	203	4460	2900	34900
5	11	200	5.9	450	150	182	3360	3600	32700
6	12	200	6.5	400	150	162	2340	2500	15800
7	12	200	6.5	350	150	142	1880	1200	6090
8	12	200	6.5	300	150	122	1670	1300	5860
9	12	200	6.5	250	150	101	1730	1600	7470
10	12	200	6.5	200	150	81	2520	4100	27900
11	12	200	6.5	200	150	81	2520	5200	35400
12	12	200	6.5	175	150	71	1860	3800	19100
13	12	200	6.5	150	150	61	2010	3500	19000
14	12	200	6.5	125	150	51	1970	3300	17600
15	12	200	6.5	100	150	41	1480	3000	12000
16	12	200	6.5	85	140	32	1310	2600	9200
17	12	200	6.5	80	140	30	1050	1890	5360
18	13	200	7.0	75	130	26	902	1700	4140
19	15	200	8.1	75	130	26	812	1310	2870
20	15	200	8.1	70	120	23	704	1270	2410
21	15	200	8.1	55	110	16	626	1400	2370
22	15	200	8.1	44	100	12	538	1620	2350
23	20	200	11	210	500	284	469	1230	1560
24	400	150	162	634	1000	1710	469	750	950
25	400	150	162	930	1500	3770	420	830	941
26	375	150	152	1130	3000	9150	378	820	837
27	500	150	203	4080	4000	44100	349	780	735
28	475	150	192	6980	5000	94200	333	750	674
29	450	150	182	--	--	--	305	480	395
30	425	150	172	--	--	--	294	540	429
31	400	150	162	--	--	--	311	530	445
TOTAL	3717	--	1544.9	19048	--	155244	56780	--	490586

## 06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.--Continued

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	305	510	420	1150	7200	22400	940	24000	60900
2	272	480	353	920	5600	13900	626	17000	28700
3	261	420	296	812	3800	8330	384	18500	19200
4	230	310	193	794	3000	6430	803	18800	40800
5	220	240	143	776	2700	5660	1110	22400	67100
6	215	180	104	713	13000	25000	1070	18300	52900
7	210	190	108	668	8800	15900	970	14500	38000
8	215	260	151	570	4500	6930	848	10500	24000
9	230	250	155	427	2000	2310	610	9000	14800
10	225	230	140	349	1120	1060	434	9300	10900
11	220	230	137	366	920	909	950	20000	51300
12	230	240	149	327	840	742	930	11000	27600
13	240	250	162	311	750	630	785	3500	7420
14	225	270	164	272	530	389	642	2800	4850
15	200	300	162	250	330	223	469	4300	5450
16	200	280	151	245	320	212	355	3600	3450
17	163	240	106	245	360	238	338	2500	2280
18	134	210	76	225	330	200	695	12200	27500
19	195	2000	1100	230	280	174	1470	25500	101000
20	225	3000	1820	186	150	75	1340	20500	74200
21	360	6200	6030	154	140	58	1820	29000	143000
22	618	11000	18400	146	130	51	2000	29000	157000
23	1760	22000	105000	142	130	50	586	26800	42400
24	1560	26000	110000	138	130	48	1470	11700	46400
25	1420	20000	76700	129	110	38	1460	10200	40200
26	1040	13600	38200	138	150	56	1890	9400	48000
27	830	9800	22000	200	780	421	2010	8200	44500
28	839	7000	15900	200	950	513	2040	9700	53400
29	1360	7500	27500	245	1200	794	1890	6700	34200
30	1420	7600	29100	267	2600	1870	1510	4300	17500
31	--	--	--	355	7420	12000	--	--	--
TOTAL	15622	--	454920	11950	--	127611	32445	--	1288950

DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1140	2700	8310	125	300	101	21	85	4.8
2	875	1500	3540	93	170	43	159	880	378
3	634	900	1540	74	90	18	483	12500	33500
4	554	830	1240	63	65	11	1830	41000	203000
5	490	750	992	66	55	9.8	1220	27000	88900
6	420	500	567	63	45	7.7	1540	37000	154000
7	355	380	364	87	80	19	1310	30000	106000
8	316	310	264	83	90	20	803	22000	47700
9	289	270	211	77	85	18	554	16000	23900
10	250	250	169	72	80	16	366	12200	12100
11	225	240	146	74	80	16	278	9700	7280
12	195	220	116	69	90	17	210	7800	4420
13	172	210	98	66	90	16	172	7000	3250
14	168	190	86	63	85	14	142	5200	1990
15	150	170	69	63	80	14	117	3800	1200
16	163	140	62	63	70	12	110	2900	861
17	163	150	66	58	55	8.6	100	2380	643
18	154	180	75	58	50	7.8	97	1920	503
19	146	160	63	52	50	7.0	87	1320	310
20	129	110	38	50	50	6.8	87	1050	247
21	121	80	26	48	45	5.8	77	1580	328
22	110	65	19	48	45	5.8	103	4200	1170
23	113	70	21	48	50	6.5	134	7000	2530
24	121	90	29	77	340	71	253	5800	3960
25	97	90	24	60	200	32	159	3900	1670
26	103	105	29	46	85	11	129	4700	1640
27	113	120	37	37	50	5.0	125	4400	1490
28	154	240	100	28	45	3.4	87	3000	705
29	278	360	270	17	35	1.6	46	1840	229
30	245	320	212	15	45	1.8	30	1400	113
31	168	350	159	13	45	1.6	--	--	--
TOTAL	8611	--	18942	1856	--	528.2	10829	--	704021.8

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

166184  
3257789.9

## LITTLE MISSOURI RIVER BASIN

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C). WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2010	1920	---	---	---	---	1860	---	---	970	2200	---
2	2010	2020	---	---	---	571	1900	1440	1630	---	---	---
3	2040	2050	---	---	---	551	1890	---	2050	---	2340	---
4	2080	2050	---	---	---	680	1820	1460	1820	1120	---	1190
5	2110	2080	---	---	---	638	1830	---	1660	---	2240	1230
6	2110	1990	---	---	---	610	1920	1480	---	1260	---	1550
7	2110	1990	---	---	---	653	---	---	---	---	2470	1150
8	2120	2050	---	---	---	675	1900	---	1470	1350	---	---
9	2090	2080	---	---	---	725	---	1660	---	---	---	1140
10	2090	2180	---	---	---	740	1900	---	1620	1440	2250	---
11	1880	2180	---	---	---	730	---	1640	---	---	---	1340
12	2080	---	---	---	---	757	2020	---	---	1550	2250	---
13	2320	---	---	---	---	860	---	1730	1500	---	---	1280
14	2040	---	---	---	---	947	2090	---	---	1660	2260	---
15	2070	---	---	---	---	995	---	1770	1470	---	---	1380
16	1920	---	---	---	---	1060	2050	---	---	1750	2310	---
17	1800	---	---	---	---	1150	---	1860	1510	---	---	1420
18	1780	---	---	---	---	1150	2070	---	---	1820	2310	---
19	1870	---	---	---	---	1060	---	---	1220	---	---	---
20	1910	---	---	---	---	1240	2040	2060	1440	1820	2400	1530
21	1960	---	---	---	---	1300	---	---	---	---	---	---
22	1980	---	---	---	---	1320	1820	2070	1200	1910	2400	---
23	1980	---	---	---	---	1400	2230	---	1330	---	---	---
24	1930	---	---	---	---	1620	1720	1980	---	1850	2300	1680
25	1940	---	---	---	---	1620	1970	2060	1380	---	---	---
26	1930	---	---	---	---	1620	1660	---	---	1900	2300	1700
27	2010	---	---	---	---	1670	1720	2060	1240	---	---	---
28	2020	---	---	---	---	1700	1720	---	---	1960	---	---
29	2010	---	---	---	---	1800	1670	2050	1100	---	2430	1630
30	2020	---	---	---	---	1760	1650	---	---	2000	---	---
31	2130	---	---	---	---	1890	---	2060	---	---	2350	---
MONTH	2010	---	---	---	---	1120	---	---	---	---	---	---

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

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

06338490 MISSOURI RIVER AT GARRISON DAM, N. DAK.

LOCATION.--Lat 47°30'08", long 101°25'50", in S $\frac{1}{4}$  sec.31, T.147 N., R.84 W., Mercer County, downstream from dam at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam, 2.5 mi (4.0 km) west of Riverdale and 14 mi (23 km) upstream from Knife River at mile 1,389.9 (kilometre 2,236.3).

DRAINAGE AREA.--181,400 mi<sup>2</sup> (469,800 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: October 1971 to current year.

Specific conductance: October 1971 to current year.

Water temperature: October 1971 to current year.

EXTREMES.--Current year:

Dissolved solids: Maximum, 487 mg/l Mar. 1-31; minimum, 408 mg/l May 1 to June 30.

Hardness: Maximum, 210 mg/l Sept. 1-30; minimum, 190 mg/l May 1 to June 30.

Specific conductance: Maximum daily, 778 micromhos Mar. 23; minimum daily, 602 micromhos May 5.

Water temperature: Maximum daily, 13.5°C Oct. 1-6; minimum daily, 1.0°C on many days during Dec. to Feb.

Period of record:

Dissolved solids: Maximum, 487 mg/l Mar. 1-31, 1973; minimum, 390 mg/l Sept. 1-30, 1972

Hardness: Maximum, 220 mg/l Jan. 1-31, 1972; minimum, 190 mg/l May 1 to June 30, 1973.

Specific conductance: Maximum daily, 778 micromhos Mar. 23, 1973; minimum daily, 602 micromhos May 5, 1973.

Water temperature: Maximum daily, 14.5°C Oct. 1-3 and Sept. 25 and 26, 1972; minimum daily, 0.5°C on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Minimum observed during water year:

Dissolved solids, 398 mg/l Apr. 23.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (NA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT.									
01-31	21200	50	19	58	8.2	178	0	146	416
NOV.									
01-30	22300	49	19	57	4.3	177	0	145	412
DEC.									
01-31	22800	47	20	55	3.6	178	0	146	444
JAN.									
01-31	26800	48	19	57	4.2	177	0	145	428
FEB.									
01-28	25100	50	19	63	4.4	186	0	153	441
MAR.									
01-31	25200	49	20	69	4.3	183	0	150	487
APR.									
01-30	20100	47	19	64	4.1	174	0	143	422
MAY									
01-31	16900	48	18	59	3.8	176	0	144	408
JUNE									
01-30	18600	47	18	56	3.9	178	0	146	408
JULY									
01-31	19900	49	19	55	4.2	182	0	149	416
AUG.									
01-31	20600	48	19	54	3.9	184	0	151	426
SEP.									
01-30	19400	51	20	57	4.3	184	0	151	--
WTD. AVG. TIME WTD.	--	49	19	59	4.4	180	0	147	430
AVG.	21600	49	19	59	4.4	180	0	147	428
TONS PER DAY	--	2830	1110	3420	259	10500	0	8590	--

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT.								
01-31	.57	23800	200	57	37	1.8	630	7.8
NOV.								
01-30	.56	24800	200	55	38	1.8	639	8.3
DEC.								
01-31	.60	27300	200	54	37	1.7	643	8.3
JAN.								
01-31	.58	31000	200	53	38	1.8	643	8.1
FEB.								
01-28	.60	29900	200	51	40	1.9	646	8.1
MAR.								
01-31	.66	33100	200	55	42	2.1	700	7.7
APR.								
01-30	.57	22900	200	53	41	2.0	636	7.6
MAY								
01-31	.55	18600	190	50	39	1.8	631	8.1
JUNE								
01-30	.55	20500	190	45	38	1.8	619	8.3
JULY								
01-31	.57	22400	200	51	37	1.7	626	8.3
AUG.								
01-31	.58	23700	200	47	37	1.7	645	8.2
SEP.								
01-30	--	--	210	59	37	1.7	652	8.2
WTD. AVG. TIME WTD.	.58	--	199	53	--	1.8	644	8.1
AVG.	.58	--	199	53	38	1.8	643	8.1
TONS PER DAY	--	--	--	--	--	--	--	--

## MISSOURI RIVER MAIN STEM

06338490 MISSOURI RIVER AT GARRISON DAM, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED TAS- SODIUM (NA) (MG/L)	DIS- SOLVED PO- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
OCT.												
26...	1330	28700	6.7	--	--	--	47	20	55	4.2	174	0
NOV.												
21...	1230	30000	6.9	--	--	--	49	20	58	4.1	175	0
JAN.												
09...	1245	35600	7.0	--	--	--	48	20	58	4.0	176	5
FEB.												
21...	1300	28900	7.1	--	--	--	50	20	63	4.5	184	0
APR.												
23...	1300	18500	7.2	0	9	0	47	19	57	4.1	172	0
MAY												
22...	1240	20200	7.4	--	--	--	48	18	55	3.8	171	0
JUNE												
19...	1445	24500	7.7	--	--	--	47	19	52	3.8	181	0
JULY												
24...	1200	19100	7.5	--	--	--	51	19	56	3.6	182	0
AUG.												
21...	1445	30700	7.7	--	--	--	50	19	54	3.6	182	0
SEP.												
25...	1230	25700	7.9	0	10	16	50	19	56	4.2	188	0

DATE	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
OCT.												
26...	143	160	8.9	.7	.15	.02	420	.57	32500	200	57	37
NOV.												
21...	144	170	7.8	.6	.14	.01	424	.58	34300	200	61	38
JAN.												
09...	153	180	10	.5	.16	.03	424	.58	40800	200	49	38
FEB.												
21...	151	180	8.2	.6	.23	.02	400	.54	31200	210	56	39
APR.												
23...	141	170	8.4	.5	.21	.03	398	.54	19900	200	55	38
MAY												
22...	140	160	9.0	.3	.13	.00	410	.56	22400	190	54	38
JUNE												
19...	148	160	9.0	.4	.12	.00	422	.57	27900	200	47	36
JULY												
24...	149	160	9.5	.5	.10	.00	406	.55	20900	210	56	37
AUG.												
21...	149	170	9.3	.4	.17	.00	400	.54	33200	200	54	36
SEP.												
25...	154	170	8.8	.5	.16	.02	400	.54	27800	200	49	37

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BERYL- LIUM (BE) (UG/L)	DIS- SOLVED BORDON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT.												
26...	1.7	638	8.0	10.0	10	--	0	--	--	110	1	--
NOV.												
21...	1.8	627	7.9	7.0	5	--	2	--	--	100	0	--
JAN.												
09...	1.8	630	8.5	2.0	5	--	5	--	--	120	0	--
FEB.												
21...	1.9	668	8.1	3.0	6	--	5	--	--	110	0	--
APR.												
23...	1.8	624	8.0	3.5	10	.00	2	0	0	120	0	0
MAY												
22...	1.7	620	8.0	6.0	9	--	0	--	--	120	0	--
JUNE												
19...	1.6	628	8.2	11.0	4	--	0	--	--	40	0	--
JULY												
24...	1.7	630	8.3	12.5	6	--	2	--	--	130	0	--
AUG.												
21...	1.7	632	8.2	13.0	4	--	0	--	--	120	2	--
SEP.												
25...	1.7	636	7.9	13.0	4	.00	0	0	0	130	0	0

DATE	DIS- SOLVED COBALT (CO) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
APR.												
23...	0	2	2	40	.0	2	1	7	0	400	.3	10
SEP.												
25...	0	7	1	40	.0	2	6	4	0	530	.0	10



## 06338490 MISSOURI RIVER AT GARRISON DAM, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT AT 0800)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	631	623	603	616	663	680	720	630	620	631	638	660
2	630	618	612	636	657	681	715	622	620	632	640	652
3	624	619	613	632	672	681	720	622	622	631	637	654
4	625	617	614	632	668	682	721	620	622	631	640	668
5	626	623	617	632	679	682	723	602	622	632	638	652
6	625	622	613	631	670	683	727	618	622	631	637	640
7	625	624	616	631	672	680	730	618	622	633	640	637
8	633	624	620	632	675	682	715	625	625	637	643	652
9	633	622	620	639	675	720	710	620	622	637	642	650
10	624	618	620	638	660	721	716	620	624	637	642	650
11	622	617	620	632	659	721	715	620	624	637	640	642
12	621	618	622	632	662	722	710	620	625	637	640	640
13	621	617	619	631	663	721	701	620	625	637	640	644
14	624	617	622	631	659	730	703	620	625	633	640	638
15	627	617	622	632	680	731	703	621	625	638	639	645
16	636	620	622	632	685	734	703	625	625	637	653	655
17	633	623	621	641	672	729	695	620	621	637	647	660
18	627	620	622	649	668	729	695	620	621	637	643	656
19	625	619	622	638	668	770	695	620	621	639	643	655
20	624	620	622	637	675	772	700	620	621	639	647	655
21	620	622	617	634	670	775	700	620	622	640	642	662
22	620	618	620	636	680	775	710	620	624	640	642	664
23	621	620	622	636	708	778	715	620	625	642	642	667
24	628	622	622	635	710	682	715	626	625	642	647	680
25	627	623	617	646	705	678	712	620	622	631	645	675
26	625	623	618	643	705	670	711	620	621	633	642	680
27	623	635	618	639	705	670	711	620	621	633	642	680
28	623	637	617	638	705	663	711	620	621	633	642	682
29	618	637	617	641	---	652	712	620	621	633	642	680
30	628	637	618	641	---	650	712	620	622	630	643	682
31	632	---	620	641	---	652	---	624	---	631	643	---
MONTH	626	622	618	636	678	706	711	620	623	635	642	659

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT AT 0800)

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

06340900 MISSOURI RIVER NEAR HENSLER, N. DAK.

LOCATION.--Lat 47°16'45", long 101°11'03", in SW¼ sec.22, T.144 N., R.83 W., McLean County, temperature recorder at gaging station, on left bank 2.8 mi (4.5 km) northwest of Hensler, about 7.5 mi (12.1 km) west of Washburn, and at mile 1362 (kilometre 2,191).

DRAINAGE AREA.--183,000 mi<sup>2</sup> (474,000 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Water temperatures: April 1967 to current year.

EXTREMES.--Current year:

Water temperatures: Maximum recorded, 17.0°C Aug. 9-11 and 17; minimum recorded, 0.0°C on many days during December to February.

Period of record:

Water temperatures: Maximum, 17.0°C on several days in 1968-69; freezing point on many days during winter months.

REMARKS.--Values estimated from Dec. 3 to Jan. 8.

## TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	14.5	14.0	8.5	8.0	4.0	4.0	0.0	0.0	0.0	0.0	1.0	1.0
2	15.0	14.0	8.0	8.0	4.0	3.0	0.0	0.0	0.0	0.0	1.0	1.0
3	15.0	14.5	8.0	8.0	3.0	2.5	0.0	0.0	0.0	0.0	1.0	1.0
4	15.0	14.0	8.0	8.0	2.0	1.5	0.0	0.0	0.0	0.0	1.0	1.0
5	14.5	12.5	8.0	8.0	1.5	1.5	0.0	0.0	0.5	0.0	1.0	1.0
6	13.0	12.5	8.0	8.0	1.5	1.5	0.0	0.0	0.5	0.5	1.0	1.0
7	14.0	13.0	8.0	8.0	1.5	1.5	0.0	0.0	0.5	0.5	1.0	1.0
8	14.0	13.0	8.0	7.5	1.5	1.5	0.0	0.0	0.5	0.5	1.0	1.0
9	13.0	12.5	7.5	7.5	1.5	1.5	0.0	0.0	0.5	0.5	1.5	1.0
10	12.5	12.5	7.5	7.5	1.5	1.5	0.0	0.0	0.5	0.5	1.5	1.5
11	12.5	11.5	7.5	7.5	1.5	1.5	0.0	0.0	0.5	0.5	1.5	1.5
12	12.0	11.5	7.5	7.0	1.5	1.5	0.0	0.0	0.5	0.5	1.5	1.5
13	12.0	12.0	7.0	7.0	1.5	1.5	0.0	0.0	0.5	0.5	1.5	1.5
14	12.0	11.5	7.0	6.0	1.5	1.0	0.0	0.0	0.5	0.5	1.5	1.5
15	11.5	11.5	6.0	6.0	1.0	1.0	0.0	0.0	0.5	0.5	1.5	1.5
16	11.5	11.0	6.0	6.0	0.5	0.5	0.0	0.0	0.5	0.5	1.5	1.5
17	11.0	10.5	6.0	6.0	0.0	0.0	0.0	0.0	1.0	0.5	1.5	1.5
18	10.5	10.5	6.0	5.5	0.0	0.0	0.0	0.0	1.0	1.0	1.5	1.5
19	10.5	9.5	5.5	5.5	0.0	0.0	0.0	0.0	1.0	1.0	1.5	1.5
20	10.5	9.5	5.5	5.5	0.0	0.0	0.0	0.0	1.0	1.0	1.5	1.5
21	---	---	5.5	5.5	0.0	0.0	0.0	0.0	1.0	1.0	2.0	1.5
22	---	---	5.5	5.5	0.0	0.0	0.0	0.0	1.0	1.0	2.0	2.0
23	---	---	5.5	5.5	0.0	0.0	0.0	0.0	1.0	1.0	2.0	2.0
24	---	---	6.0	5.5	0.0	0.0	0.0	0.0	1.0	1.0	2.0	2.0
25	9.5	9.5	6.0	5.0	0.0	0.0	0.0	0.0	1.0	1.0	2.0	2.0
26	9.5	9.5	5.0	5.0	0.0	0.0	0.0	0.0	1.0	1.0	2.5	2.0
27	9.5	9.5	5.0	4.5	0.0	0.0	0.0	0.0	1.0	1.0	2.5	2.5
28	9.5	9.5	4.5	4.5	0.0	0.0	0.0	0.0	1.0	1.0	2.5	2.5
29	9.5	8.5	4.5	3.5	0.0	0.0	0.0	0.0	---	---	2.5	2.5
30	8.5	8.5	4.0	3.5	0.0	0.0	0.0	0.0	---	---	2.5	2.5
31	8.5	8.5	---	---	0.0	0.0	0.0	0.0	---	---	2.5	2.5
MONTH	15.0	8.5	8.5	3.5	4.0	0.0	0.0	0.0	1.0	0.0	2.5	1.0

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.5	2.5	---	---	11.0	10.0	15.0	13.5	16.0	14.5	16.0	15.0
2	2.5	2.5	---	---	11.5	10.5	14.5	12.5	15.5	14.0	15.0	15.0
3	2.5	2.5	---	---	11.5	10.5	15.0	13.5	15.0	14.0	15.0	14.5
4	2.5	2.5	---	---	10.5	10.0	16.0	14.5	16.0	14.5	15.0	14.5
5	2.5	2.5	---	---	12.0	10.0	16.0	14.5	16.0	15.0	16.5	15.0
6	2.5	2.5	---	---	12.5	11.0	15.5	14.0	16.0	14.5	16.5	16.0
7	2.5	2.5	---	---	12.5	12.0	15.5	14.5	14.5	14.0	16.5	15.5
8	2.5	2.5	---	---	12.0	11.5	15.5	13.5	15.5	14.5	16.0	15.5
9	2.5	2.5	---	---	13.5	11.5	15.5	14.0	17.0	15.5	16.5	15.5
10	2.5	2.5	---	---	13.0	11.5	15.5	13.5	17.0	16.0	16.5	16.0
11	3.0	2.5	---	---	12.0	11.0	15.5	13.5	17.0	15.5	16.0	15.0
12	3.0	3.0	---	---	12.0	11.0	15.0	13.5	16.5	15.0	15.5	15.0
13	3.0	3.0	---	---	13.5	11.5	14.5	13.5	16.5	15.0	15.0	14.5
14	3.5	3.0	---	---	15.0	12.5	15.0	14.0	16.5	15.0	14.5	13.5
15	3.5	3.0	---	---	14.5	12.5	15.5	14.0	16.0	15.5	14.5	14.0
16	3.0	2.5	---	---	12.5	11.5	15.5	13.5	16.5	15.5	14.5	14.5
17	3.5	3.0	---	---	12.5	10.5	15.0	13.5	17.0	15.5	14.5	14.0
18	3.5	3.5	8.5	8.0	12.5	11.5	14.5	13.0	16.5	15.0	14.5	14.0
19	5.0	3.5	9.5	8.5	11.5	11.5	14.0	13.0	16.5	15.5	14.5	13.5
20	---	---	10.0	8.5	12.5	11.5	14.5	13.0	16.0	15.0	13.5	12.0
21	---	---	10.0	8.5	14.0	12.5	---	---	16.0	15.5	13.0	12.0
22	---	---	8.5	8.0	15.0	13.5	---	---	16.0	14.5	---	---
23	---	---	8.5	8.5	14.5	13.0	---	---	16.0	15.0	---	---
24	---	---	9.5	8.5	14.5	13.0	---	---	16.0	15.0	---	---
25	---	---	9.5	9.5	14.0	12.0	14.0	13.5	15.5	14.5	14.0	13.0
26	---	---	9.5	8.5	15.0	13.0	15.5	13.5	16.5	15.0	14.5	14.0
27	---	---	9.0	8.5	15.0	13.5	15.5	14.0	16.5	15.5	15.0	14.5
28	---	---	9.5	9.0	15.0	14.0	15.5	14.0	16.0	15.0	15.0	14.5
29	---	---	10.5	9.0	15.0	13.0	15.0	14.5	16.0	15.0	15.0	15.0
30	---	---	10.5	9.5	15.5	13.5	15.0	14.0	16.5	15.0	15.0	14.5
31	---	---	10.5	9.5	---	---	16.0	14.5	16.5	15.5	---	---
MONTH	---	---	---	---	15.5	10.0	16.0	12.5	17.0	14.0	16.5	12.0

## PAINTED WOODS CREEK BASIN

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06341800 PAINTED WOODS CREEK NEAR WILTON, N. DAK.

LOCATION.--Lat 47°16'30", long 100°47'30", in SW¼SW¼ sec.23, T.144 N., R.80 W., McLean County, at gaging station on right bank 600 ft (180 m) upstream from county highway bridge, 7 mi (11 km) upstream from Yanktonai Creek, and 8 mi (13 km) north of Wilton.

DRAINAGE AREA.--427 mi<sup>2</sup> (1,110 km<sup>2</sup>), approximately, of which about 310 mi<sup>2</sup> (800 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--September 1970 to current year.

REMARKS.--No flow July 12-25. Flows during summer increased by aquifer dewatering for McClusky Canal. Miscellaneous samples of chemical data published for water years 1958-64, 1970.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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)
OCT.										
25...	1430	38	24	--	10	10	110	160	400	41
NOV.										
22...	1000	1.7	14	--	40	130	110	170	520	42
JAN.										
10...	1300	.12	30	--	50	850	130	130	560	24
FEB.										
22...	1300	.29	19	--	130	320	73	45	240	11
MAR.										
08...	1330	20	12	20	170	80	25	17	52	10
21...	1400	6.6	13	--	140	150	40	32	110	11
APR.										
26...	1030	1.4	4.3	--	50	90	65	58	260	14
MAY										
23...	1130	.22	12	--	30	70	62	67	330	14
JUNE										
21...	1030	.28	.4	--	110	0	22	63	340	13
AUG.										
20...	1630	.16	2.2	--	60	10	21	68	440	19
SEP.										
25...	1530	.73	.9	0	40	8	27	73	450	19

DATE	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)
OCT.										
25...	407	16	360	1400	47	.3	.01	.04	2530	3.44
NOV.										
22...	578	0	474	1500	54	.3	.01	.02	3000	4.08
JAN.										
10...	1110	0	910	1200	38	.3	.06	.11	2720	3.70
FEB.										
22...	617	0	506	410	11	.2	.06	.10	1130	1.54
MAR.										
08...	172	0	141	110	4.9	.2	.17	.16	372	.51
21...	302	0	248	210	7.3	.3	.03	.06	644	.88
APR.										
26...	538	0	441	480	16	.2	.03	.06	1160	1.58
MAY										
23...	580	22	512	540	17	.4	.04	.11	1430	1.94
JUNE										
21...	386	69	431	570	17	.3	.04	.01	1310	1.78
AUG.										
20...	365	123	504	690	25	.3	.03	.05	1700	2.31
SEP.										
25...	504	75	538	750	23	.3	.03	.02	1670	2.27

## PAINTED WOODS CREEK BASIN

06341800 PAINTED WOODS CREEK NEAR WILTON, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT. 25...	260	930	570	47	5.7	2990	8.4	4.0	10	3
NOV. 22...	13.8	970	500	52	7.3	3440	8.2	1.0	20	2
JAN. 10...	.88	860	0	58	8.3	3400	7.4	.0	30	10
FEB. 22...	.88	370	0	58	5.4	1600	7.5	.5	40	4
MAR. 08...	20.1	130	0	44	2.0	519	7.8	.0	90	3
21...	11.5	230	0	49	3.1	919	8.1	3.0	50	2
APR. 26...	4.38	400	0	57	5.7	1660	8.4	9.0	40	9
MAY 23...	.85	430	0	62	6.9	1880	8.6	18.0	40	20
JUNE 21...	.99	310	0	69	8.3	1910	9.0	16.0	40	8
AUG. 20...	.73	330	0	73	11	2670	9.3	23.5	50	7
SEP. 25...	3.29	370	0	71	10	2440	9.1	12.5	40	20

DATE	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	CYANIDE (CN) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)
OCT. 25...	12.4	100	--	--	--	750	--	--	--	10
NOV. 22...	13.0	98	--	--	--	840	--	--	--	13
JAN. 10...	3.4	25	--	--	--	800	--	--	--	4
FEB. 22...	10.8	80	--	--	--	370	--	--	--	8
MAR. 08...	11.0	80	.00	0	0	210	0	0	0	16
21...	12.5	99	--	--	--	230	--	--	--	6
APR. 26...	10.7	98	--	--	--	380	--	--	--	2
MAY 23...	11.4	128	--	--	--	490	--	--	--	11
JUNE 21...	11.6	125	--	--	--	530	--	--	--	12
AUG. 20...	8.7	108	--	--	--	690	--	--	--	4
SEP. 25...	7.9	78	.00	0	0	690	0	0	0	5

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT. 25...	4	--	--	--	--	--	--	--	20
NOV. 22...	1	--	--	--	--	--	--	--	20
JAN. 10...	0	--	--	--	--	--	--	--	20
FEB. 22...	2	--	--	--	--	--	--	--	20
MAR. 08...	3	30	.1	2	1	10	200	1.2	20
21...	3	--	--	--	--	--	--	--	20
APR. 26...	3	--	--	--	--	--	--	--	10
MAY 23...	0	--	--	--	--	--	--	--	10
JUNE 21...	1	--	--	--	--	--	--	--	20
AUG. 20...	3	--	--	--	--	--	--	--	10
SEP. 25...	3	180	.0	3	4	7	390	.0	10

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LOCATION.--Lat 46°48'51", long 100°49'12", in SE¼NW¼SE¼ sec.31, T.139 N., R.80 W., Burleigh County, at gaging station, on left bank 40 ft (12 m) upstream from Bismarck city waterplant, 2,100 ft (640 m) downstream from Burlington Northern Railway bridge, 1.6 mi (2.6 km) northwest of Bismarck Post Office, 3.5 mi (5.6 km) upstream from Heart River and at mile 1,314.5 (kilometre 2,115.0).

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1972 (monthly), October 1972 to current year (partial-record station).  
Specific conductance: October 1972 to current year (weekly).  
Water temperatures: October 1966 to current year.  
Sediment records: June 1946 to current year.

Sediment concentration: Maximum daily, 282 mg/l Mar. 6; minimum daily, 80 mg/l Jan. 26-31, Feb. 6-25.  
Sediment discharge: Maximum daily, 22,100 tons Mar. 6; minimum daily, 4,690 tons Feb. 7.

Sediment concentration (1972-73): Maximum daily, 2,800 mg/l May 7, 1972; minimum daily, 30 mg/l Jan. 24 and 25, 1972.

Sediment discharge (1972-73): Maximum daily, 258,000 tons Apr. 8, 1972; minimum daily, 2,480 tons Jan. 25, 1972.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

[illegible]



## MISSOURI RIVER MAIN STEM

06342500 MISSOURI RIVER AT BISMARCK, N. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	10.5	6.5	6.5	2.5	2.0	0.0	0.0	0.0	0.0	1.0	0.5
2	13.0	12.0	6.5	6.5	2.0	1.5	0.0	0.0	0.0	0.0	1.0	1.0
3	13.5	13.0	6.5	6.5	1.5	1.0	0.0	0.0	0.0	0.0	1.0	1.0
4	13.5	13.5	7.0	6.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0
5	13.5	11.5	7.0	7.0	0.5	0.5	0.0	0.0	0.0	0.0	1.0	1.0
6	11.5	10.5	7.0	7.0	0.5	0.5	0.0	0.0	0.0	0.0	1.0	1.0
7	11.5	10.5	7.0	7.0	0.5	0.5	0.0	0.0	0.0	0.0	1.5	1.0
8	11.5	11.5	7.0	6.5	0.5	0.5	0.0	0.0	0.0	0.0	1.5	1.5
9	11.5	10.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	2.0	1.5
10	11.0	10.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	2.5	2.0
11	11.0	10.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	2.5	2.5
12	10.5	10.5	6.5	6.0	0.5	0.5	0.0	0.0	0.0	0.0	2.5	2.5
13	10.5	10.5	6.0	5.5	0.5	0.5	0.0	0.0	0.0	0.0	2.5	2.5
14	10.5	10.0	5.5	5.0	0.5	0.0	0.0	0.0	0.0	0.0	2.5	2.5
15	10.0	9.5	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
16	9.5	9.5	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
17	9.5	8.5	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
18	8.5	8.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
19	8.0	8.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
20	8.5	8.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
21	9.0	8.5	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
22	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
23	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
24	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
25	9.0	9.0	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.5
26	9.0	9.0	4.5	4.0	0.0	0.0	0.0	0.0	0.5	0.0	3.5	2.5
27	9.0	8.5	4.0	4.0	0.0	0.0	0.0	0.0	0.5	0.5	4.0	3.5
28	8.5	8.0	4.0	3.5	0.0	0.0	0.0	0.0	0.5	0.5	4.0	3.5
29	8.0	7.5	3.5	2.5	0.0	0.0	0.0	0.0	---	---	4.0	3.5
30	7.5	6.5	2.5	2.5	0.0	0.0	0.0	0.0	---	---	3.5	3.5
31	6.5	6.5	---	---	0.0	0.0	0.0	0.0	---	---	3.5	3.5
MONTH	13.5	6.5	7.0	2.5	2.5	0.0	0.0	0.0	0.5	0.0	4.0	0.5

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

06342500 MISSOURI RIVER AT BISMARCK, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	21500	187	10900	27400	247	18300	21700	231	13500
2	21700	183	10700	27400	247	18300	22000	235	14000
3	21100	177	10100	27400	247	18300	22000	237	14100
4	21500	180	10400	27400	245	18100	22000	239	14200
5	21800	182	10700	27500	246	18300	22000	220	13100
6	21700	190	11100	27700	247	18500	21000	200	11300
7	22000	192	11400	27400	245	18100	20000	180	9720
8	22100	193	11500	27700	247	18500	19000	160	8210
9	22200	193	11600	27500	248	18400	18000	140	6800
10	20800	187	10500	27700	249	18600	17000	120	5510
11	21700	192	11200	26300	241	17100	17000	120	5510
12	22600	200	12200	26100	239	16800	17000	120	5510
13	24700	213	14200	26600	245	17600	17000	120	5510
14	21200	192	11000	25500	240	16500	17000	120	5510
15	22700	203	12400	23900	233	15000	18000	120	5830
16	23200	208	13000	23600	233	14800	19000	110	5640
17	22000	201	11900	23300	229	14400	20000	110	5940
18	22800	210	12900	23600	231	14700	21000	110	6240
19	22800	213	13100	23200	229	14300	21800	110	6470
20	22600	209	12800	23900	233	15000	22200	110	6590
21	22200	204	12200	22800	226	13900	22400	110	6650
22	23300	211	13300	22400	224	13500	21900	110	6500
23	22900	209	12900	23000	227	14100	22700	110	6740
24	23000	209	13000	22500	224	13600	23100	110	6860
25	22800	208	12800	22400	224	13500	23600	110	7010
26	23900	215	13900	22800	228	14000	23300	100	6290
27	24600	219	14500	22800	231	14200	24400	100	6590
28	25300	226	15400	23000	232	14400	24900	100	6720
29	27000	238	17400	22600	232	14200	25700	100	6940
30	26900	240	17400	21900	232	13700	26100	100	7050
31	27400	247	18300	--	--	--	25000	100	6750
TOTAL	712000	--	394700	747300	--	478700	657800	--	243290

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	24200	100	6530	28500	90	6930	30700	130	10800
2	26500	100	7160	28800	90	7000	29800	170	13700
3	26000	100	7020	29100	90	7070	29600	200	16000
4	26000	100	7020	28500	90	6930	30200	230	18800
5	26800	100	7240	28700	90	6970	29700	260	20800
6	27500	100	7430	26400	80	5700	29000	282	22100
7	27700	100	7480	21700	80	4690	28500	277	21300
8	27900	100	7530	24100	80	5210	28500	277	21300
9	28100	100	7590	27800	80	6000	27800	270	20300
10	28300	100	7640	27600	80	5960	28300	271	20700
11	28500	100	7700	23300	80	5030	28500	272	20900
12	28700	100	7750	26700	80	5770	26700	261	18800
13	28900	100	7800	27600	80	5960	29100	276	21700
14	29100	100	7860	24000	80	5180	28100	270	20500
15	29100	100	7860	21900	80	4730	28700	273	21200
16	29100	90	7070	23900	80	5160	29000	275	21500
17	29600	90	7190	24300	80	5250	29000	275	21500
18	29200	90	7100	27500	80	5940	28600	273	21100
19	28700	90	6970	29500	80	6370	27700	267	20000
20	29400	90	7140	29600	80	6390	27800	268	20100
21	29100	90	7070	28800	80	6220	27700	267	20000
22	28400	90	6900	29000	80	6260	27300	265	19500
23	28900	90	7020	28500	80	6160	27400	265	19600
24	30100	90	7310	28100	80	6070	27200	264	19400
25	31200	90	7580	28900	80	6240	26700	259	18700
26	29300	80	6330	29400	90	7140	23900	240	15500
27	29700	80	6420	29400	90	7140	24200	239	15600
28	26700	80	5770	30500	90	7410	25100	245	16600
29	26700	80	5770	--	--	--	24700	242	16100
30	27000	80	5830	--	--	--	25600	250	17300
31	27600	80	5960	--	--	--	28500	267	20500
TOTAL	874000	--	219040	762100	--	170880	863600	--	591900

## MISSOURI RIVER MAIN STEM

06342500 MISSOURI RIVER AT BISMARCK, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	APRIL			MAY			JUNE		
	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	27500	259	19200	16700	185	8340	19500	170	8950
2	23800	237	15200	17200	185	8590	19000	165	8460
3	25400	246	16900	18200	189	9290	18400	159	7900
4	26900	256	18600	17200	181	8410	19000	165	8460
5	26200	251	17800	17300	177	8270	18200	164	8060
6	25200	245	16700	17200	176	8170	18900	164	8370
7	25000	244	16500	16100	170	7390	19800	170	9090
8	25500	252	17400	16400	169	7480	19200	164	8500
9	25700	253	17600	16900	172	7850	20700	171	9560
10	25300	248	16900	16200	170	7440	18800	157	7970
11	26600	251	18000	16700	173	7800	18900	157	8010
12	27100	252	18400	16800	174	7890	20200	170	9270
13	27200	248	18200	16700	173	7800	19400	163	8540
14	27200	248	18200	15700	167	7080	18500	148	7390
15	25600	239	16500	15900	166	7130	19500	154	8110
16	23900	233	15000	16600	168	7530	20700	162	9050
17	22800	224	13800	18100	177	8650	20800	171	9600
18	21600	214	12500	18100	177	8650	19400	167	8750
19	21300	208	12000	19200	184	9540	19400	167	8750
20	20600	204	11300	18800	179	9090	18600	162	8140
21	19000	194	9950	19600	182	9630	18800	157	7970
22	17700	193	9220	20200	186	10100	19200	152	7880
23	17600	195	9270	20100	187	10100	21000	161	9130
24	18100	198	9680	20900	194	10900	21600	165	9620
25	18500	200	9990	18100	177	8650	20200	158	8620
26	18500	198	9890	18800	182	9240	20000	160	8640
27	17900	192	9280	20000	187	10100	20200	158	8620
28	17700	191	9130	19900	186	9990	21300	165	9490
29	17500	189	8930	18700	174	8790	20600	161	8950
30	16800	185	8390	19400	174	9110	20900	163	9200
31	--	--	--	20300	179	9810	--	--	--
TOTAL	679700	--	420430	558000	--	268810	590700	--	259050

DAY	JULY			AUGUST			SEPTEMBER		
	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	20500	160	8860	20800	158	8870	23000	171	10600
2	21100	164	9340	21200	160	9160	21800	166	9770
3	20700	162	9050	21100	162	9230	22600	175	10700
4	21700	165	9670	21100	162	9230	21800	173	10200
5	20400	153	8430	21200	160	9160	21700	174	10200
6	22700	167	10200	21500	162	9400	21400	168	9710
7	24700	179	11900	21400	164	9480	21800	170	10000
8	23600	172	11000	21800	170	10000	21900	171	10100
9	21200	158	9040	22700	174	10700	21400	166	9590
10	22300	162	9750	24100	180	11700	21600	167	9740
11	22900	166	10300	23300	175	11000	21900	169	9990
12	22100	161	9610	21900	167	9870	21400	168	9710
13	22200	164	9830	20200	156	8510	21400	168	9710
14	22400	170	10300	22100	168	10000	21500	173	10000
15	21100	162	9230	21200	162	9270	21600	178	10400
16	20600	154	8570	21300	163	9370	21300	179	10300
17	21900	162	9580	21300	158	9090	20900	174	9820
18	21200	160	9160	21400	159	9190	22200	182	10900
19	21500	164	9520	21400	159	9190	21900	180	10600
20	21500	164	9520	21100	162	9230	20700	173	9670
21	21100	162	9230	21800	166	9770	19800	172	9200
22	20900	160	9030	21500	164	9520	19100	168	8660
23	20000	157	8480	21400	166	9590	19100	168	8660
24	22000	169	10000	21200	165	9440	19500	170	8950
25	22300	171	10300	21800	168	9890	19900	170	9130
26	17800	144	6920	22300	169	10200	19600	166	8780
27	20300	157	8610	22200	166	9950	19300	162	8440
28	21200	162	9270	23200	172	10800	19600	164	8680
29	21000	163	9240	25200	187	12700	19000	158	8110
30	20900	160	9030	23500	176	11200	19200	159	8240
31	21000	161	9130	23100	174	10900	--	--	--
TOTAL	664800	--	292100	679300	--	305610	627900	--	288560

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

8417200

3933070

## MISSOURI RIVER MAIN STEM

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06342500 MISSOURI RIVER AT BISMARCK, N. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHOPHOS- PHORUS (P) (MG/L)	TEMPER- ATURE (DEG C)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)
JAN. 16...	1400	29500	.17	.05	.05	.01	.0	610
APR. 09...	1130	24600	.15	.03	.03	.01	2.0	635
JUNE 20...	1045	19900	.12	.01	.03	.00	12.5	600

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AND BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPER- ATURE (DEG C)	NUMBER OF SAM- PLING POINTS	DIS- CHARGE (CFS)	SUS- PENDED SEDI- MENT (MG/L)	SUS- PENDED SEDI- MENT CHARGE (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
OCT. 24...	1200	8.5	11	23200	133	8330	23	61	100
MAR. 12...	1200	2.5	11	26600	360	25900	15	42	99
26...	1200	4.0	11	23700	190	12200	25	47	99
APR. 11...	1600	5.5	11	27000	294	21400	22	49	100
MAY 02...	1600	7.5	9	18000	177	8600	18	47	98
JUNE 05...	1600	13.5	9	19400	190	9950	26	55	98
JULY 17...	1600	19.0	10	22100	179	10700	24	63	98
AUG. 16...	1600	19.0	10	21200	160	9160	27	64	99
SEP. 21...	1500	13.0	10	19800	196	10500	21	66	100

DATE	SUS. SED. FALL DIAM. % FINER THAN .500 MM	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	BED MAT. FALL DIAM. % FINER THAN 1.00 MM	BED MAT. FALL DIAM. % FINER THAN 2.00 MM	BED MAT. FALL DIAM. % FINER THAN 4.00 MM	BED MAT. FALL DIAM. % FINER THAN 8.00 MM
OCT. 24...	--	0	8	73	98	99	100	--	--
MAR. 12...	100	0	4	64	98	100	--	--	--
26...	100	0	4	73	99	100	--	--	--
APR. 11...	--	1	11	84	99	100	--	--	--
MAY 02...	100	0	10	77	98	100	--	--	--
JUNE 05...	100	0	13	65	98	100	--	--	--
JULY 17...	100	2	31	89	98	99	99	99	100
AUG. 16...	100	1	17	85	99	100	--	--	--
SEP. 21...	--	1	10	85	99	100	--	--	--

## HEART RIVER BASIN

06349000 HEART RIVER NEAR MANDAN, N. DAK.

LOCATION.--Lat 46°50'02", long 100°58'27", in NW¼NE¼ sec.25, T.139 N., R.82 W., Morton County, on left bank near downstream wingwall of bridge on county highway, 3 mi (5 km) west of Mandan and 4 mi (6 km) downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 mi<sup>2</sup> (8,570 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analysis: Water years 1946-50 (partial-record station), October 1971 to September 1972 (monthly).

Specific conductance: July 1972 to current year (weekly).

Water temperature: July 1972 to current year (weekly).

Sediment records: May 1948 to current year.

EXTREMES.--Current year:

Sediment concentration: Maximum daily, 950 mg/l Mar. 10; minimum daily 3 mg/l Sept. 30.

Sediment discharge: Maximum daily, 6,280 tons Mar. 7; minimum daily 0.28 ton Sept. 30.

Period of record:

Sediment concentration (1972-73): Maximum daily, 3,450 mg/l Mar. 16, 17 and Apr. 13, 1972; minimum daily 1 mg/l Feb. 6 to Mar. 10, 1972.

Sediment discharge (1972-73): Maximum daily, 59,600 tons Mar. 16, 1972; minimum daily, 0.03 ton Feb. 8 to Mar. 9, 1972.

REMARKS.--Sediment records from May 1948 to Sept. 1971 available from U.S. Corps of Engineers, Omaha, Neb.

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AND BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPER- ATURE (DEG C)	NUMBER OF SAM- PLING POINTS	DIS- CHARGE (CFS)	SUS- PEN- DED SED- IMENT DIS- CHARGE (MG/L)	SUS- PEN- DED SED- IMENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	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
NOV. 20...	1015	.5	21	56	30	4.5	--	--	--	--	--
MAR. 05...	1550	1.0	--	3470	608	5700	28	41	65	87	90
09...	1430	4.0	9	2280	690	4250	26	29	42	82	91
30...	1030	5.5	19	275	72	53	--	26	37	64	75
APR. 27...	1305	12.0	20	282	85	65	--	--	--	59	75
MAY 24...	1505	18.0	24	150	65	26	--	--	--	--	--
JUNE 25...	0845	21.5	15	94	33	8.5	--	--	--	--	--
JULY 23...	0845	18.5	20	101	29	7.9	--	--	--	--	--
SEP. 18...	1245	14.5	20	78	16	3.4	--	--	--	--	--

DATE	SUS. SED. FALL DIAM. % FINER THAN .250 MM	SUS. SED. FALL DIAM. % FINER THAN .500 MM	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	BED MAT. FALL DIAM. % FINER THAN 1.00 MM	BED MAT. FALL DIAM. % FINER THAN 2.00 MM	BED MAT. FALL DIAM. % FINER THAN 4.00 MM	BED MAT. FALL DIAM. % FINER THAN 8.00 MM
NOV. 20...	--	--	0	3	49	96	99	99	100	--
MAR. 05...	97	100	--	--	--	--	--	--	--	--
09...	96	100	1	4	38	94	99	99	99	100
30...	100	--	6	27	74	98	100	--	--	--
APR. 27...	99	100	4	20	60	97	100	--	--	--
MAY 24...	--	--	2	7	49	97	100	--	--	--
JUNE 25...	--	--	0	3	41	93	99	99	100	--
JULY 23...	--	--	2	3	58	96	100	--	--	--
SEP. 18...	--	--	1	4	46	90	99	100	--	--



06349000 HEART RIVER NEAR MANDAN, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	45	10	1.2	35	20	1.9	52	45	6.3
2	41	14	1.5	35	20	1.9	50	45	6.1
3	38	20	2.1	40	18	1.9	48	45	5.8
4	44	20	2.4	50	22	3.0	46	50	6.2
5	51	20	2.8	45	25	3.0	44	50	5.9
6	53	20	2.9	40	30	3.2	42	50	5.7
7	54	18	2.6	45	35	4.3	40	50	5.4
8	47	18	2.3	50	40	5.4	38	55	5.6
9	51	18	2.5	50	40	5.4	36	55	5.3
10	55	18	2.7	50	45	6.1	34	60	5.5
11	50	18	2.4	50	45	6.1	32	60	5.2
12	46	20	2.5	50	50	6.8	32	65	5.6
13	44	20	2.4	50	50	6.8	32	65	5.6
14	41	20	2.2	50	55	7.4	32	70	6.0
15	38	20	2.1	50	50	6.8	32	75	6.5
16	38	22	2.3	52	45	6.3	32	75	6.5
17	36	22	2.1	54	40	5.8	34	75	6.9
18	37	22	2.2	56	35	5.3	36	75	7.3
19	37	24	2.4	56	35	5.3	36	70	6.8
20	35	24	2.3	56	30	4.5	36	70	6.8
21	35	22	2.1	54	30	4.4	36	70	6.8
22	35	20	1.9	54	35	5.1	36	65	6.3
23	33	22	2.0	54	35	5.1	34	65	6.0
24	33	22	2.0	54	35	5.1	34	60	5.5
25	33	22	2.0	54	35	5.1	34	55	5.0
26	33	22	2.0	54	40	5.8	34	55	5.0
27	36	22	2.1	54	40	5.8	34	50	4.6
28	35	22	2.1	52	40	5.6	34	45	4.1
29	35	22	2.1	52	40	5.6	32	45	3.9
30	35	22	2.1	52	40	5.6	30	40	3.2
31	35	--	--	--	--	--	28	40	3.0
TOTAL	1259	--	66.3	1498	--	150.4	1130	--	174.4

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	28	40	3.0	130	35	12	3000	130	1050
2	28	40	3.0	130	35	12	2800	160	1210
3	28	50	3.8	130	30	11	3100	350	2930
4	26	50	3.5	125	25	8.4	3200	700	6050
5	24	55	3.6	125	25	8.4	3450	650	6050
6	24	55	3.6	125	25	8.4	3400	650	5970
7	24	60	3.9	125	30	10	3100	750	6280
8	24	60	3.9	125	30	10	2500	650	4390
9	22	60	3.6	115	30	9.3	2300	650	4040
10	20	60	3.2	110	30	8.9	2000	950	5130
11	18	60	2.9	105	35	9.9	1740	900	4230
12	18	60	2.9	95	35	9.0	1530	750	3100
13	18	60	2.9	90	40	9.7	1370	650	2400
14	20	60	3.2	80	50	11	1240	600	2010
15	22	60	3.6	70	60	11	1130	600	1830
16	22	55	3.3	60	70	11	985	450	1200
17	22	55	3.3	55	70	10	877	380	900
18	32	55	4.8	50	80	11	787	290	616
19	40	55	5.9	55	90	13	708	230	440
20	45	55	6.7	50	100	14	644	190	330
21	50	50	6.8	45	110	13	584	150	237
22	50	50	6.8	55	120	18	532	120	172
23	50	50	6.8	75	100	20	489	100	132
24	55	50	7.4	125	55	19	447	85	103
25	75	50	10	200	65	35	415	70	78
26	125	45	15	1000	85	230	377	60	61
27	140	30	11	2000	120	648	342	55	51
28	150	20	8.1	2500	110	743	318	55	47
29	145	25	9.8	--	--	--	297	70	56
30	140	20	7.6	--	--	--	273	65	48
31	135	30	11	--	--	--	253	55	38
TOTAL	1620	--	174.9	7950	--	1934.0	44188	--	61179

## HEART RIVER BASIN

06349000 HEART RIVER NEAR MANDAN, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	APRIL			MAY			JUNE		
	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	235	65	41	245	70	46	145	60	23
2	220	65	39	230	50	31	115	55	17
3	208	60	34	215	40	23	92	50	12
4	198	65	35	208	35	20	97	55	14
5	190	65	33	193	35	18	118	55	18
6	183	60	30	180	35	17	153	55	23
7	178	55	26	168	40	18	143	45	17
8	175	55	26	168	40	18	130	40	14
9	175	65	31	160	40	17	125	40	14
10	163	60	26	150	40	16	105	40	11
11	153	55	23	143	35	14	99	40	11
12	145	55	22	145	30	12	99	40	11
13	138	60	22	125	30	10	90	40	9.7
14	130	55	19	120	35	11	79	35	7.5
15	118	50	16	103	40	11	74	35	7.0
16	115	45	14	90	40	9.7	76	30	6.2
17	123	40	13	82	35	7.7	97	40	10
18	113	40	12	78	35	7.4	99	40	11
19	105	40	11	73	35	6.9	99	35	9.4
20	113	70	21	67	35	6.3	101	35	9.5
21	145	65	25	66	35	6.2	110	40	12
22	180	65	32	58	35	5.5	123	70	23
23	230	60	37	74	40	8.0	113	50	15
24	258	55	38	133	65	23	105	40	11
25	258	60	42	101	55	15	97	35	9.2
26	273	75	55	99	65	17	92	35	8.7
27	279	85	64	163	75	33	79	30	6.4
28	276	85	63	170	60	28	78	30	6.3
29	264	80	57	215	60	35	78	30	6.3
30	253	85	58	185	45	22	76	30	6.2
31	--	--	--	168	55	25	--	--	--
TOTAL	5594	--	965	4375	--	537.7	3087	--	359.4

DAY	JULY			AUGUST			SEPTEMBER		
	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	71	22	4.2	103	24	6.7	68	18	3.3
2	70	18	3.4	103	20	5.6	76	24	4.9
3	67	14	2.5	105	18	5.1	78	40	8.4
4	61	12	2.0	113	20	6.1	78	30	6.3
5	53	10	1.4	113	22	6.7	73	22	4.3
6	46	9	1.1	110	20	5.9	74	20	4.0
7	39	7	.74	113	24	7.3	71	20	3.8
8	33	5	.45	115	24	7.5	66	18	3.2
9	56	20	3.0	130	30	11	64	18	3.1
10	64	22	3.8	135	40	15	63	18	3.1
11	64	22	3.8	110	35	10	63	16	2.7
12	61	20	3.3	81	30	6.6	66	16	2.9
13	55	12	1.8	74	20	4.0	64	14	2.4
14	53	9	1.3	71	16	3.1	61	12	2.0
15	49	9	1.2	68	14	2.6	51	10	1.4
16	48	8	1.0	73	14	2.8	68	30	5.5
17	46	7	.87	71	16	3.1	78	24	5.1
18	48	12	1.6	66	16	2.9	76	18	3.7
19	54	20	2.9	64	16	2.8	73	16	3.2
20	79	30	6.4	63	16	2.7	71	14	2.7
21	84	30	6.8	63	18	3.1	62	12	2.0
22	86	30	7.0	63	18	3.1	46	12	1.5
23	105	30	8.5	60	16	2.6	40	12	1.3
24	130	30	11	63	12	2.0	42	10	1.1
25	135	35	13	61	10	1.6	41	10	1.1
26	145	40	16	64	16	2.8	40	9	.97
27	148	40	16	68	20	3.7	37	7	.70
28	140	35	13	71	18	3.5	36	6	.58
29	130	30	11	68	16	2.9	35	4	.38
30	99	20	5.3	66	16	2.9	34	3	.28
31	101	25	6.8	67	18	3.3	--	--	--
TOTAL	2420	--	161.16	2595	--	149.0	1795	--	85.91

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

77511  
 65937.17

## HEART RIVER BASIN

97

06349000 HEART RIVER NEAR MANDAN, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	1350	---	498	770	---	---	---	---	1350
2	---	---	---	---	---	483	---	1120	1140	1340	1320	---
3	1110	1380	---	---	---	560	790	---	---	---	---	---
4	---	---	---	---	975	720	---	1100	1170	---	---	---
5	---	---	---	---	---	960	855	---	---	---	1320	---
6	---	1320	---	---	1050	980	---	1170	---	1380	---	1320
7	1000	---	---	1500	---	986	851	---	1120	---	1320	---
8	---	---	---	---	---	920	---	1080	---	1360	---	1330
9	---	---	1550	---	---	900	868	---	1170	---	---	---
10	---	---	---	---	---	850	---	1080	---	---	---	---
11	---	1220	---	---	---	810	928	---	1280	---	1300	1340
12	---	---	---	---	1130	757	---	1200	---	1340	---	---
13	---	---	---	1550	---	717	---	---	---	---	---	---
14	---	1420	---	---	---	701	972	---	1320	---	---	---
15	1260	---	1770	---	---	679	---	---	---	1320	---	1360
16	---	---	---	---	---	662	---	---	1320	---	1340	---
17	---	---	---	---	1240	700	1040	1250	---	---	---	---
18	---	---	---	---	---	657	---	1200	1240	---	---	1260
19	1300	---	---	---	---	640	---	---	---	---	1360	---
20	---	1300	---	1350	---	---	1030	---	1140	1340	---	---
21	---	---	1640	---	---	670	---	1280	---	---	---	1360
22	1260	---	---	---	1190	661	---	---	---	1330	1320	---
23	---	---	---	---	---	---	1030	1160	1130	1280	---	---
24	---	1300	---	---	1040	675	---	1080	---	1290	---	---
25	1260	---	---	---	---	680	---	1140	1210	---	1400	1290
26	---	---	---	---	790	682	1080	---	---	1260	---	---
27	---	---	1480	---	550	---	---	1100	---	---	---	1380
28	---	---	---	1160	---	---	940	---	1320	1270	1350	---
29	---	---	---	1160	---	---	---	1500	---	---	---	---
30	1260	1480	---	1040	---	670	934	---	1260	1320	1400	1380
31	---	---	---	---	---	670	---	1100	---	---	---	---
MONTH	---	---	---	---	---	726	---	---	---	---	---	---

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	0.0	---	0.0	11.0	---	---	---	---	20.5
2	---	---	---	---	---	0.0	---	10.0	24.5	16.5	21.0	---
3	11.5	0.0	---	---	---	0.0	10.0	19.0	---	---	---	---
4	---	---	---	---	0.0	0.0	---	13.5	20.0	---	---	---
5	---	---	---	---	---	0.0	10.5	---	---	---	28.5	---
6	---	1.5	---	---	0.0	0.0	---	13.0	---	22.0	---	23.5
7	9.0	---	---	0.0	---	0.0	3.0	---	21.0	---	23.0	---
8	---	---	---	---	---	0.0	---	14.0	---	18.5	---	19.0
9	---	---	0.0	---	---	2.0	2.0	---	20.0	---	---	---
10	---	---	---	---	---	4.5	---	12.0	---	---	---	---
11	6.0	0.5	---	---	---	4.5	6.5	---	22.0	---	20.0	24.5
12	---	---	---	---	0.0	4.0	---	11.0	---	28.0	---	---
13	---	---	---	0.0	---	3.0	---	---	---	---	---	---
14	---	0.0	---	---	---	3.0	10.0	---	30.0	---	---	---
15	4.5	---	0.0	---	---	1.5	---	---	---	16.5	---	13.0
16	---	---	---	---	---	2.0	---	---	18.0	---	18.0	---
17	---	---	---	---	0.0	1.0	16.5	21.0	---	---	---	---
18	---	---	---	---	---	1.5	---	15.5	17.0	---	---	17.0
19	0.0	---	---	---	---	4.5	---	---	---	---	23.5	---
20	---	0.0	---	0.0	---	---	13.0	---	20.0	18.0	---	---
21	---	---	0.0	---	---	5.5	---	15.5	---	---	---	12.0
22	4.0	---	---	---	0.0	4.5	---	---	---	19.5	24.5	---
23	---	---	---	---	---	---	8.0	14.5	29.0	19.0	---	---
24	---	0.0	---	---	0.0	5.0	---	12.5	---	19.0	---	---
25	2.0	---	---	---	---	3.0	---	18.0	20.0	---	19.5	14.5
26	---	---	---	---	0.0	11.0	12.0	---	---	19.5	---	---
27	---	---	0.0	---	0.0	---	---	14.5	---	---	---	10.0
28	---	---	---	0.0	---	7.0	11.0	---	22.0	18.5	21.0	---
29	---	---	---	0.0	---	---	---	15.5	---	---	---	---
30	0.0	0.0	---	0.0	---	6.5	13.5	---	22.0	18.5	19.0	13.5
31	---	---	---	---	---	9.0	---	19.0	---	---	---	---
MONTH	---	---	---	---	---	3.0	---	---	---	---	---	---

## APPLE CREEK BASIN

06349500 APPLE CREEK NEAR MENOKEN, N. DAK.

LOCATION.--Lat 46°47'40", long 100°39'25", in NW¼NE¼ sec.9, T.138 N., R.79 W., Burleigh County, at gaging station on left bank 75 ft (23 m) downstream from bridge on county highway, 4 mi (6 km) upstream from Hay Creek, 6.3 mi (10 km) west of Menoken, and 6.4 mi (10 km) east of Bismarck.

DRAINAGE AREA.--1,680 mi<sup>2</sup> (4,350 km<sup>2</sup>), approximately, of which about 500 mi<sup>2</sup> (1,300 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--October 1972 to September 1973 (discontinued).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
OCT.										
24...	1615	.56	18	180	140	43	35	270	7.8	590
NOV.										
17...	0930	1.7	14	40	0	56	34	260	7.7	706
JAN.										
08...	1535	1.0	25	0	500	69	47	280	6.8	780
FEB.										
20...	1450	.85	28	20	560	77	48	280	7.1	817
MAR.										
09...	1400	43	6.7	240	10	19	11	32	8.6	121
23...	1345	12	8.1	120	100	26	17	63	9.3	195
APR.										
25...	1115	4.7	6.4	140	120	44	27	140	7.3	393
MAY										
21...	1130	.92	9.0	0	280	53	36	200	7.5	549
JUNE										
20...	1445	.58	16	0	310	51	26	240	7.6	583
JULY										
26...	1445	.14	20	190	200	50	30	290	7.5	710
AUG.										
24...	1130	.13	25	150	220	30	40	340	7.4	773
SEP.										
24...	1520	.12	18	100	70	50	26	280	7.0	671

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITAS AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
OCT.										
24...	32	537	220	39	.5	.23	.26	1000	1.36	1.51
NOV.										
17...	0	579	220	40	.5	.45	--	1000	1.36	4.59
JAN.										
08...	0	640	260	57	.7	1.2	.22	1170	1.59	3.16
FEB.										
20...	0	670	240	63	.8	.11	.15	1120	1.52	2.57
MAR.										
09...	0	99	56	4.4	.0	.56	.17	202	.27	23.5
23...	0	160	110	8.4	.1	.23	.09	327	.44	10.6
APR.										
25...	0	322	200	19	.2	.45	.07	620	.84	7.87
MAY										
21...	0	450	220	32	.3	.56	.22	855	1.16	2.12
JUNE										
20...	15	503	210	34	.4	.36	.28	948	1.29	1.48
JULY										
26...	0	582	230	48	.6	.56	.42	1060	1.44	.40
AUG.										
24...	0	634	250	54	1.0	.63	.55	1150	1.56	.40
SEP.										
24...	0	550	210	45	.3	.56	.31	981	1.33	.32

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
OCT.									
24...	250	0	69	7.4	1500	8.6	4.0	2.6	1100
NOV.									
17...	280	0	66	6.8	1510	8.2	1.0	7.1	1200
JAN.									
08...	370	0	62	6.4	1740	7.9	.0	16	1000
FEB.									
20...	390	0	60	6.2	1730	7.8	.0	21	640
MAR.									
09...	93	0	40	1.4	338	6.9	1.0	24	130
23...	140	0	48	2.4	538	7.5	3.5	9.9	210
APR.									
25...	220	0	57	4.1	991	8.0	9.5	6.3	390
MAY									
21...	280	0	60	5.2	1320	8.1	17.0	7.0	530
JUNE									
20...	230	0	68	6.8	1400	8.3	17.5	4.9	690
JULY									
26...	250	0	71	8.0	1610	8.1	22.5	9.0	1200
AUG.									
24...	240	0	75	9.6	1750	7.9	19.0	16	900
SEP.									
24...	230	0	72	8.0	1530	8.0	10.5	11	950

06349700 MISSOURI RIVER NEAR SCHMIDT, N. DAK.

LOCATION.--Lat 46°39'22", long 100°44'18", in SW¼NE¼ sec.26, T.137 N., R.80 W., Morton County, temperature recorder at gaging station, on right bank 2 mi (3.2 km) southeast of railroad siding at Schmidt, and 13 mi (21 km) south of Mandan at mile 1,298 (kilometre 2,088).

DRAINAGE AREA.--191,700 mi<sup>2</sup> (496,500 km<sup>2</sup>).

PERIOD OF RECORD.--Water temperatures: June 1967 to current year.

EXTREMES.--Current year:

Water temperatures: Maximum, 20.5°C July 11-12; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 22.0°C July 12, 13, 1968; minimum, freezing point on many days during winter months.

REMARKS.--Values were estimated from Jan. 1 to 9.

## TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	14.0	12.5	5.5	5.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
2	14.5	14.0	5.5	5.5	2.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
3	15.0	14.5	6.0	5.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.0
4	15.0	15.0	6.5	6.0	0.5	0.5	0.0	0.0	0.0	0.0	1.0	0.5
5	15.0	12.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	1.0	1.0
6	12.5	11.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	1.0	1.0
7	12.0	11.5	6.5	6.5	0.5	0.5	0.0	0.0	0.0	0.0	1.0	1.0
8	12.5	12.0	6.5	6.0	0.5	0.5	0.0	0.0	0.0	0.0	1.5	1.0
9	12.5	12.0	6.0	6.0	0.5	0.5	0.0	0.0	0.0	0.0	2.0	1.5
10	12.0	12.0	6.0	6.0	0.5	0.5	0.0	0.0	0.0	0.0	3.0	2.0
11	12.0	11.5	6.0	6.0	0.5	0.5	0.0	0.0	0.0	0.0	3.0	3.0
12	11.5	11.0	6.0	5.0	0.5	0.5	0.0	0.0	0.0	0.0	3.0	3.0
13	11.5	11.0	5.0	5.0	0.5	0.5	0.0	0.0	0.0	0.0	3.0	3.0
14	11.5	11.5	5.0	3.5	0.5	0.5	0.0	0.0	0.0	0.0	3.0	3.0
15	11.5	10.5	3.5	3.5	0.5	0.0	0.0	0.0	0.0	0.0	3.0	3.0
16	10.5	10.5	4.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
17	10.5	9.5	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
18	9.5	8.5	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
19	8.5	8.5	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
20	8.5	8.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
21	9.0	8.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
22	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
23	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
24	9.0	9.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
25	9.0	8.0	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.0
26	9.0	8.0	4.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	3.5
27	9.0	8.0	4.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	5.0	4.5
28	8.0	7.0	3.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	4.0
29	7.0	6.0	3.0	2.0	0.0	0.0	0.0	0.0	---	---	4.0	3.5
30	6.0	5.0	2.5	2.0	---	---	0.0	0.0	---	---	4.0	3.5
31	5.5	5.0	---	---	---	---	0.0	0.0	---	---	4.0	4.0
MONTH	15.0	5.0	6.5	2.0	2.5	0.0	0.0	0.0	0.0	0.0	5.0	0.0

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



## CANNONBALL RIVER BASIN

06351000 CANNONBALL RIVER BELOW BENTLEY, N. DAK.

LOCATION.--Lat 46°21'30", long 102°02'30", in SW¼SW¼ sec. 6, T.133 N., R.90 W., Grant County, at gaging station on left bank 0.25 mi (0.4 km) downstream from Thirty Mile Creek, 2 mi (3.2 km) northeast of Bentley.

DRAINAGE AREA.--1,140 mi<sup>2</sup> (2,950 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analysis: Water years 1946-51 (partial-record station); October 1972 to current year. Sediment records: April 1946 to September 1950.

Prior to 1951, collected at site 8 mi (13 km) downstream, published as "near New Leipzig."

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
NOV. 15...	1650	31	3.6	--	180	120	110	280	6.9	451
DEC. 15...	1115	14	5.3	90	120	160	140	350	7.6	586
JAN. 23...	1250	133	8.6	290	260	80	75	200	14	235
MAR. 05...	1540	379	5.9	320	150	32	23	55	9.3	111
APR. 12...	1635	59	.5	440	70	98	91	240	7.2	357
MAY 10...	1950	37	1.0	0	40	150	160	480	11	445
JUNE 15...	1325	33	3.4	0	40	130	140	390	10	373
JULY 12...	1600	5.8	6.0	190	80	110	110	430	9.2	439
AUG. 09...	1405	5.6	6.1	250	40	100	100	370	8.8	446
SEP. 13...	1440	6.8	5.2	20	40	86	84	390	8.2	449

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITAS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
NOV. 15...	0	370	940	12	.4	.56	.01	1770	2.41	148
DEC. 15...	0	481	1210	17	.4	.56	.02	2320	3.16	87.7
JAN. 23...	0	193	690	11	.1	2.9	.04	1200	1.63	431
MAR. 05...	0	91	200	4.7	.1	.56	.07	366	.50	375
APR. 12...	0	293	840	10	.2	.23	.01	1520	2.07	242
MAY 10...	0	365	1650	16	.3	.23	.03	2800	3.81	280
JUNE 15...	0	306	1390	12	.3	.56	.02	2300	3.13	205
JULY 12...	0	360	1200	12	.4	.56	.03	2230	3.03	34.9
AUG. 09...	0	366	1030	12	.6	.05	.04	1940	2.64	29.3
SEP. 13...	0	368	1000	11	.3	.23	.02	1830	2.49	33.6

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
NOV. 15...	750	380	44	4.4	2270	8.1	.0	5.7	560
DEC. 15...	980	500	44	4.9	2880	7.8	.0	15	860
JAN. 23...	510	320	45	3.9	1670	7.1	1.0	30	260
MAR. 05...	180	84	39	1.8	600	6.8	.5	28	0
APR. 12...	620	330	45	4.2	2010	8.1	12.0	4.5	40
MAY 10...	1000	670	50	6.5	3440	8.2	15.0	4.5	940
JUNE 15...	900	600	48	5.7	2850	8.2	22.5	3.8	440
JULY 12...	730	370	56	6.9	2840	8.0	26.5	7.0	0
AUG. 09...	660	300	54	6.3	2560	8.1	22.0	5.7	860
SEP. 13...	560	190	60	7.2	2460	7.9	17.0	9.0	730

06352500 CEDAR CREEK NEAR PRETTY ROCK, N. DAK.

LOCATION.--Lat 46°01'55", long 101°49'55", in S½ sec.33, T.130 N., R.89 W., Grant County, on left bank on downstream side of county highway bridge, 7 mi (11 km) north of Keldron, S. Dak., 10.5 mi (16.9 km) south of abandoned townsite of Pretty Rock, and 15 mi (24 km) downstream from Timber Creek.

DRAINAGE AREA.--1,340 mi<sup>2</sup> (3,470 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: Water years 1946-51 (partial record station), October 1971 to September 1973 (discontinued).  
Sediment records: May 1946 to September 1949.

REMARKS.--Chemical data furnished by North Dakota State Water Commission.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)
OCT.										
12...	1545	25	3.9	0	60	120	130	320	9.4	405
NOV.										
15...	1430	34	4.1	80	100	130	140	360	8.5	452
DEC.										
14...	1410	13	4.8	560	80	180	180	430	8.5	571
JAN.										
23...	1615	256	6.6	310	180	60	60	120	14	177
MAR.										
06...	1120	525	5.9	280	150	49	44	92	10	152
APR.										
12...	1305	54	1.6	320	80	120	120	260	8.7	392
MAY										
10...	1610	43	1.9	0	80	150	180	440	13	470
JUNE										
15...	1025	49	1.3	110	40	110	160	400	11	367
JULY										
12...	1125	7.5	3.6	0	100	140	170	530	12	424
SEP.										
13...	1230	2.2	5.4	60	70	110	130	430	11	420

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
OCT.										
12...	0	332	1130	14	.4	.23	.00	1900	2.58	128
NOV.										
15...	0	371	1270	15	.4	.45	.02	2200	2.99	202
DEC.										
14...	0	468	1560	17	.6	.88	.00	2760	3.75	96.9
JAN.										
23...	0	145	500	9.4	.1	1.6	.08	885	1.20	612
MAR.										
06...	0	125	370	6.5	.1	.45	.02	641	.87	909
APR.										
12...	0	322	950	15	.3	.23	.00	1760	2.39	257
MAY										
10...	0	386	1650	16	.3	.23	.02	2850	3.88	331
JUNE										
15...	0	301	1470	11	.3	.29	.04	2370	3.22	314
JULY										
12...	0	348	1800	13	.4	.23	.05	2970	4.04	60.2
SEP.										
13...	0	345	1400	14	.6	.45	.04	2310	3.14	13.7

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHMS)	PH	TEMPER- ATURE (DEG C)	CARRON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (R) (UG/L)
OCT.									
12...	840	500	45	4.8	2520	7.9	10.5	8.2	940
NOV.									
15...	900	530	46	5.2	2810	8.0	.5	7.2	900
DEC.									
14...	1200	720	44	5.4	3290	7.9	.0	12	640
JAN.									
23...	400	250	39	2.6	1250	7.1	.0	23	260
MAR.									
06...	300	180	39	2.3	970	7.0	.0	24	340
APR.									
12...	790	470	41	4.0	2250	8.1	8.0	5.0	0
MAY									
10...	1100	730	46	5.7	3380	8.2	15.0	4.7	900
JUNE									
15...	930	630	48	5.7	2940	8.2	22.5	3.7	630
JULY									
12...	1100	700	52	7.1	3570	8.0	25.5	6.8	900
SEP.									
13...	810	470	53	6.6	2990	7.7	18.0	13	390

## CANNONBALL RIVER BASIN

06354000 CANNONBALL RIVER AT BREIEN, N. DAK.

LOCATION.--Lat 46°22'33", long 100°56'03", in sec.36, T.134 N., R.82 W., Morton County, at gaging station on left bank 50 ft (15 m) north of bridge on State Highway 6, 1,500 ft (457 m) downstream from Louise Creek, and 0.6 mi (1.0 km) south of Breien.

DRAINAGE AREA.--4,100 mi<sup>2</sup> (10,620 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--Chemical analyses: Water years 1946-50 (partial-record station), October 1970 to September 1972 (monthly).

Specific conductance: July 1972 to current year (weekly).

Water temperature: July 1972 to current year (weekly).

Sediment record: May 1948 to September 1951, July 1959 to current year.

EXTREMES.--Current year:

Sediment concentration: Maximum daily, 7,200 mg/l Sept. 4; minimum daily, 20 mg/l Jan. 1-17, Sept. 21-23.

Sediment discharge: Maximum daily, 10,800 tons Mar. 5; minimum daily 0.39 ton Sept. 22, 23.

Period of record:

Sediment concentration: Maximum daily, 7,200 mg/l Sept. 4, 1973; minimum daily, 10 mg/l Feb. 1-10, 1972.

Sediment discharge: Maximum daily, 172,000 tons Mar. 15, 1972; minimum daily, 0.38 ton Feb. 8-13, 1972.

REMARKS.--Sediment records from May 1948 to September 1951, July 1959 to September 1971 are available from U.S. Corps of Engineers, Omaha, Neb.

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AND BED MATERIAL, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	TEMPERATURE (DEG C)	NUMBER OF SAM- PLING POINTS	DIS- CHARGE (CFS)	SUS- PENDED SEDI- MENT (MG/L)	SUS- PENDED SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	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
NOV. 21...	1000	.5	15	73	67	13	--	--	--	--	--	--
MAR. 06...	1545	1.0	--	1680	1250	5670	23	29	41	64	78	95
13...	1005	3.0	10	797	374	805	42	56	72	82	87	98
22...	1015	5.0	10	727	449	881	--	--	--	92	94	99
APR. 24...	1010	10.0	14	252	317	216	63	74	90	--	--	--
MAY 24...	1050	17.5	19	82	73	16	--	--	--	--	--	--
JUNE 22...	0920	22.0	15	111	337	101	--	--	--	--	--	--
JULY 24...	1325	23.0	12	26	72	5.1	--	--	--	--	--	--

DATE	SUS. SED. FALL DIAM. % FINER THAN .500 MM	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	BED MAT. FALL DIAM. % FINER THAN 1.00 MM	BED MAT. FALL 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
NOV. 21...	--	2	5	38	78	93	94	97	99	100	--
MAR. 06...	100	--	--	--	--	--	--	--	--	--	--
13...	100	1	5	20	47	73	75	86	94	98	100
22...	100	0	4	15	45	77	80	90	95	98	100
APR. 24...	--	5	10	26	52	75	77	86	93	98	100
MAY 24...	--	5	9	27	54	78	80	89	94	98	100
JUNE 22...	--	5	12	33	62	84	86	94	98	100	--
JULY 24...	--	4	8	21	44	74	86	93	98	100	--

06354000 CANNONBALL RIVER AT BREIEN, N. DAK.--Continued

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER			NOVEMBER			DECEMBER		
	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	33	50	4.5	58	50	7.8	25	40	2.7
2	33	50	4.5	61	60	9.9	25	40	2.7
3	33	45	4.0	68	65	12	20	40	2.2
4	33	45	4.0	61	70	12	20	40	2.2
5	95	321	116	68	75	14	20	40	2.2
6	277	1920	1450	71	75	14	20	40	2.2
7	188	2250	1140	75	80	16	20	40	2.2
8	130	1700	597	71	80	15	20	40	2.2
9	96	750	194	69	80	15	20	30	1.6
10	80	180	39	71	80	15	20	30	1.6
11	77	100	21	75	80	16	20	30	1.6
12	77	70	15	77	75	16	20	30	1.6
13	73	65	13	44	70	8.3	25	30	2.0
14	73	65	13	44	70	8.3	25	30	2.0
15	73	65	13	68	70	13	25	30	2.0
16	69	65	12	90	70	17	30	30	2.4
17	68	65	12	98	80	21	35	30	2.8
18	66	65	12	88	80	19	35	30	2.8
19	69	70	13	92	75	19	40	30	3.2
20	73	95	19	84	70	16	40	30	3.2
21	68	100	18	75	65	13	30	30	2.4
22	64	95	16	59	60	9.6	30	30	2.4
23	61	80	13	56	60	9.1	25	30	2.0
24	59	65	10	62	60	10	25	30	2.0
25	58	50	7.8	61	60	9.9	20	30	1.6
26	58	50	7.8	50	55	7.4	20	30	1.6
27	58	50	7.8	40	55	5.9	20	30	1.6
28	58	55	8.6	35	55	5.2	18	30	1.5
29	58	55	8.6	30	50	4.1	18	30	1.5
30	56	50	7.6	30	50	4.1	18	30	1.5
31	47	50	6.3	--	--	--	18	30	1.5
TOTAL	2361	--	3807.5	1931	--	362.6	747	--	65.0

DAY	JANUARY			FEBRUARY			MARCH		
	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	16	20	.86	1100	55	163	500	165	223
2	16	20	.86	900	50	122	540	260	379
3	16	20	.86	800	65	140	650	350	614
4	16	20	.86	550	65	97	1500	1700	6890
5	16	20	.86	500	90	122	2000	2000	10800
6	16	20	.86	400	75	81	1760	1250	5940
7	16	20	.86	400	50	54	1340	1200	4340
8	16	20	.86	500	65	88	1100	1150	3420
9	14	20	.76	600	80	130	1000	1000	2700
10	14	20	.76	600	70	113	946	1000	2550
11	14	20	.76	500	80	108	880	1000	2380
12	14	20	.76	350	105	99	836	700	1580
13	12	20	.65	300	140	113	775	400	837
14	12	20	.65	200	160	86	852	1220	2810
15	12	20	.65	70	135	26	775	1600	3350
16	12	20	.65	50	85	11	655	610	1080
17	15	20	.81	50	90	12	685	560	1040
18	100	60	16	50	90	12	690	630	1170
19	350	90	85	50	90	12	745	610	1230
20	470	80	102	50	85	11	852	830	1910
21	480	60	78	50	90	12	770	670	1390
22	350	45	43	90	135	33	730	470	926
23	350	50	47	190	165	85	725	500	979
24	650	85	149	270	145	106	635	365	626
25	900	110	267	570	190	292	589	270	429
26	1200	140	454	450	130	158	526	245	348
27	1100	95	282	390	145	153	450	220	267
28	1000	55	149	490	195	258	385	220	229
29	1100	50	149	--	--	--	344	245	228
30	1100	50	149	--	--	--	309	225	188
31	1200	50	162	--	--	--	274	185	137
TOTAL	10597	--	2145.33	10520	--	2697	24818	--	60990

## CANNONBALL RIVER BASIN

06354000 CANNONBALL RIVER AT BREIEN, N. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	APRIL			MAY			JUNE		
	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	257	155	108	306	150	124	109	140	41
2	260	120	84	278	135	101	116	115	36
3	274	100	74	251	120	81	114	105	32
4	278	85	64	233	120	75	123	155	51
5	280	80	60	209	115	65	116	140	44
6	288	90	70	198	115	61	118	135	43
7	292	300	237	185	125	62	150	300	122
8	298	340	274	172	140	65	165	290	129
9	295	330	263	165	130	58	242	360	235
10	292	185	146	152	125	51	248	350	234
11	284	110	84	140	120	45	230	315	196
12	278	95	71	132	120	43	221	295	176
13	274	95	70	125	115	39	183	290	143
14	270	90	66	118	110	35	178	275	132
15	267	90	65	111	105	31	148	275	110
16	267	90	65	104	100	28	145	275	108
17	260	90	63	100	100	27	172	570	265
18	254	90	62	94	105	27	150	650	263
19	245	100	66	92	105	26	135	730	266
20	251	1100	745	86	110	26	138	575	214
21	251	380	258	80	110	24	122	450	148
22	245	165	109	77	105	22	109	335	99
23	245	165	109	73	95	19	103	305	85
24	254	270	185	77	85	18	101	290	79
25	298	610	491	73	165	33	96	260	67
26	302	450	367	92	820	237	90	235	57
27	326	360	317	198	3000	1600	107	305	88
28	348	290	272	192	4000	2070	107	315	91
29	351	230	218	162	3300	1440	96	270	70
30	330	180	160	128	1250	432	88	245	58
31	--	--	--	114	210	65	--	--	--
TOTAL	8414	--	5223	4517	--	7030	4220	--	3682

DAY	JULY			AUGUST			SEPTEMBER		
	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	111	872	347	15	60	2.4	1.6	160	.69
2	115	1590	502	13	90	3.2	1.9	170	.87
3	88	235	56	12	95	3.1	20	194	11
4	85	70	16	12	100	3.2	264	7200	5200
5	78	70	15	12	105	3.4	173	2240	1170
6	70	65	12	12	110	3.6	75	520	105
7	62	65	11	11	115	3.4	42	415	47
8	54	65	9.5	9.9	120	3.2	26	315	22
9	45	65	7.9	9.1	125	3.1	19	160	8.2
10	40	65	7.0	7.6	135	2.8	13	95	3.3
11	34	65	6.0	7.0	150	2.8	10	65	1.8
12	29	70	5.5	6.7	165	3.0	8.3	50	1.1
13	26	75	5.3	7.9	170	3.6	9.1	35	.86
14	25	70	4.7	7.3	170	3.4	9.9	30	.80
15	22	65	3.9	7.0	165	3.1	8.7	30	.70
16	19	55	2.8	6.7	170	3.1	10	35	.95
17	17	50	2.3	6.7	180	3.3	13	35	1.2
18	15	45	1.8	5.4	165	2.4	11	30	.89
19	14	35	1.3	3.9	150	1.6	8.7	30	.70
20	13	30	1.1	3.7	155	1.5	8.3	25	.56
21	12	30	.97	3.2	140	1.2	7.9	20	.43
22	12	30	.97	3.0	120	.97	7.3	20	.39
23	12	35	1.1	3.0	115	.93	7.3	20	.39
24	24	62	4.9	3.0	170	1.4	11	105	3.1
25	97	733	190	3.0	170	1.4	44	2000	409
26	55	1120	166	2.8	155	1.2	90	3200	778
27	36	175	17	2.5	150	1.0	68	2200	404
28	24	85	5.5	2.0	145	.78	51	1150	158
29	20	60	3.2	1.9	150	.77	36	370	36
30	15	50	2.0	1.7	150	.69	32	255	22
31	15	40	1.6	1.6	155	.67	--	--	--
TOTAL	1284	--	1411.34	203.6	--	70.21	1087.0	--	8388.93

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

70699.6  
95872.91



## CANNONBALL RIVER BASIN

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06354000 CANNONBALL RIVER AT BREIEN, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1700	---	---	---	980	713	1420	---	2520	---	---	2800
2	---	---	---	---	1110	591	---	---	---	2760	---	---
3	---	---	---	---	1190	642	1500	---	---	3000	---	2380
4	---	1700	---	---	1270	730	---	2800	---	3200	2210	2290
5	1690	---	---	---	1260	755	---	---	2630	---	---	2150
6	1080	---	---	---	---	816	1470	---	---	---	---	2470
7	1280	---	---	2830	1500	727	1460	---	2630	---	---	1230
8	1250	1880	---	---	1540	770	---	2660	2700	3600	2790	---
9	990	---	2570	---	1580	870	1480	---	3020	---	---	---
10	1300	---	---	---	1660	791	---	---	2840	---	---	1230
11	---	1840	---	---	1670	775	---	---	---	---	---	---
12	1580	---	---	---	1630	789	1550	2800	---	3500	2850	---
13	---	---	---	2980	---	813	---	---	---	---	---	---
14	---	1950	---	---	---	797	---	---	3180	---	---	1930
15	---	---	---	---	---	739	---	---	---	---	---	---
16	1640	---	---	---	1650	773	1730	2920	---	3500	2950	---
17	---	---	2640	---	1670	820	---	---	3200	---	---	---
18	---	1600	---	1240	1700	847	---	---	3000	---	---	1920
19	---	---	---	1290	1710	861	---	---	3210	---	---	---
20	1830	---	---	---	1700	732	1580	2920	3250	3430	3020	---
21	---	---	---	1320	1700	687	---	---	3420	---	---	---
22	---	1500	---	---	1660	780	1720	---	---	---	---	2570
23	---	---	2100	---	1280	761	---	---	3280	---	1300	---
24	1880	---	---	---	1280	868	---	---	---	3200	3000	2200
25	---	---	---	---	807	955	---	2680	---	2820	---	1550
26	---	---	---	---	645	1080	1850	---	---	2330	---	1290
27	---	1550	---	---	599	1150	---	2270	2990	2330	---	2200
28	1850	---	---	---	740	1240	---	2070	---	---	3000	2230
29	---	---	---	---	---	1300	---	1960	---	---	---	2250
30	---	1670	---	---	---	1360	2280	1950	---	---	---	1700
31	1880	---	2100	983	---	1400	---	2450	---	2060	---	---
MONTH	---	---	---	---	1360	869	---	---	---	---	---	---

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
RANDOM (INSTANTANEOUS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	---	---	---	0.0	0.0	6.5	---	18.0	---	---	20.0
2	---	---	---	---	0.0	0.0	---	---	---	15.5	---	---
3	---	---	---	---	0.0	0.5	4.5	---	---	19.0	---	16.5
4	---	0.0	---	---	0.0	0.0	---	11.0	---	20.0	21.0	17.0
5	6.5	---	---	---	0.0	0.0	---	---	13.5	---	---	17.0
6	3.0	---	---	---	0.0	0.0	5.5	---	---	---	---	13.5
7	5.5	---	---	0.0	---	0.0	2.0	---	18.0	---	---	15.5
8	8.0	0.0	---	---	0.0	0.0	---	13.5	18.0	20.0	19.0	14.5
9	5.5	---	0.0	---	0.0	0.0	0.0	---	19.0	---	---	---
10	6.5	---	---	---	0.0	0.0	---	---	19.0	---	---	18.0
11	---	0.0	---	---	0.0	2.0	---	---	---	---	---	---
12	4.5	---	---	---	0.0	1.0	5.5	9.0	---	21.0	19.0	---
13	---	---	---	0.0	---	1.0	---	---	---	---	---	---
14	---	0.0	---	---	---	0.0	---	---	21.0	---	---	11.0
15	---	---	---	---	---	0.0	---	---	---	---	---	---
16	5.5	---	---	---	0.0	1.0	4.5	12.0	---	19.0	20.0	---
17	---	---	0.0	---	0.0	0.0	---	---	15.5	---	---	---
18	---	0.0	---	0.0	0.0	1.5	---	---	16.5	---	---	8.0
19	---	---	---	0.0	0.0	1.0	---	---	13.5	---	---	---
20	2.0	---	---	---	0.0	2.0	10.0	16.5	12.0	19.0	18.0	---
21	---	---	---	0.0	0.0	3.0	---	---	14.5	---	---	---
22	---	0.0	---	---	0.0	3.0	0.0	---	---	---	---	10.0
23	---	---	0.0	---	0.0	4.0	---	---	18.0	---	24.0	---
24	1.0	---	---	---	0.0	4.5	---	---	---	21.0	18.0	12.5
25	---	---	---	---	0.0	2.0	---	12.0	---	19.0	---	9.0
26	---	---	---	---	0.0	3.0	6.5	---	---	16.5	---	12.0
27	---	0.0	---	---	0.0	5.5	---	11.0	18.0	18.0	---	10.0
28	0.0	---	---	---	0.0	4.5	---	13.5	---	---	21.0	10.0
29	---	---	---	---	---	3.0	---	14.5	---	---	---	11.0
30	---	0.0	---	---	---	3.0	10.0	15.5	---	---	---	11.0
31	0.0	---	0.0	0.0	---	5.5	---	15.5	---	18.0	---	---
MONTH	---	---	---	---	0.0	1.5	---	---	---	---	---	---

## BEAVER CREEK BASIN

06354500 BEAVER CREEK AT LINTON, N. DAK.

LOCATION.--Lat 46°15'27", long 100°13'58", on line between secs.17 and 18, T.132 N., R.76 W., Emmons County, at gaging station on left bank 60 ft (18 m) downstream from bridge on U.S. Highway 83, 0.7 mi (1.1 km) south of railway station in Linton, and 1.0 mi (1.6 km) upstream from Spring Creek.

DRAINAGE AREA.--717 mi<sup>2</sup> (1,857 km<sup>2</sup>), of which about 100 mi<sup>2</sup> (260 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analysis: October 1972 to September 1973 (discontinued).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
OCT.										
24...	1330	1.1	20	160	440	70	41	120	14	453
NOV.										
20...	1130	2.9	21	80	280	88	53	100	12	424
JAN.										
08...	1215	1.6	25	0	420	100	57	120	12	515
FEB.										
20...	1100	2.4	24	40	280	97	56	110	14	497
MAR.										
09...	1100	71	8.6	200	80	23	11	30	11	129
22...	1115	42	12	280	120	34	22	65	11	234
APR.										
16...	1430	9.7	7.2	200	50	62	36	84	11	351
MAY										
21...	1415	2.7	9.8	200	470	77	45	110	12	450
JUNE										
18...	1530	1.5	16	80	400	69	48	140	13	490
JULY										
26...	1230	.01	19	100	1200	80	36	91	9.7	464
AUG.										
22...	1400	.01	23	80	1700	88	36	89	8.9	480
SEP.										
24...	1215	.74	6.3	210	70	20	5.8	22	6.0	106

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITAS AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
OCT.										
24...	0	372	230	13	.3	.23	.43	728	.99	2.16
NOV.										
20...	0	348	280	9.2	.2	.23	.11	738	1.00	5.78
JAN.										
08...	0	422	300	11	.4	.23	.02	828	1.13	3.58
FEB.										
20...	0	408	280	13	.5	.56	.11	819	1.11	5.31
MAR.										
09...	0	106	58	4.1	.1	.84	.25	195	.27	37.4
22...	0	192	120	5.9	.1	.23	.15	364	.50	41.3
APR.										
16...	0	288	180	7.8	.2	.23	.09	606	.82	15.9
MAY										
21...	0	369	220	9.1	.2	.23	.13	709	.96	5.17
JUNE										
18...	6	412	230	8.6	.3	.23	.23	770	1.05	3.12
JULY										
26...	0	381	140	19	.3	.56	.33	656	.89	.02
AUG.										
22...	0	394	140	18	.7	.23	.39	652	.89	.02
SEP.										
24...	0	87	42	4.5	.0	.56	.20	139	.19	.28

DATE	HARD- NESS (CA, MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
OCT.									
24...	340	0	42	2.8	1100	8.0	5.0	7.2	300
NOV.									
20...	440	90	32	2.1	1150	8.0	.5	6.8	640
JAN.									
08...	480	62	34	2.4	1290	7.8	.0	13	130
FEB.									
20...	470	65	33	2.2	1220	7.8	.0	13	90
MAR.									
09...	100	0	36	1.3	351	7.0	.0	21	170
22...	180	0	43	2.1	615	7.7	4.0	7.5	210
APR.									
16...	300	15	37	2.1	855	8.1	9.5	4.5	0
MAY									
21...	380	8	38	2.5	1090	8.2	16.0	4.5	250
JUNE									
18...	370	0	44	3.2	1150	8.3	15.0	4.0	250
JULY									
26...	350	0	35	2.1	1000	8.0	25.5	7.4	170
AUG.									
22...	370	0	34	2.0	1020	7.8	20.5	12	130
SEP.									
24...	74	0	37	1.1	280	7.2	12.0	11	0

## 06355000 NORTH FORK GRAND RIVER AT HALEY, N. DAK.

LOCATION.--45°57'39", long 103°07'09", at southwest corner of sec.30, T.129 N., R.99 W., Bowman County, at gaging station on left bank 10 ft (3 m) downstream from county highway bridge, 300 ft (91 m) south of Post Office at Haley, and 1.0 mi (1.6 km) north of South Dakota state line.

DRAINAGE AREA.--509 mi<sup>2</sup> (1,318 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: November 1950 to September 1952; October 1972 to September 1973 (discontinued).  
Water temperature: March 1951 to September 1952.  
Sediment records: May 1951 to July 1952 (partial record station).

REMARKS.--Chemical data furnished by North Dakota State Water Commission. Miscellaneous samples of chemical data published for water year 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
NOV.										
14...	1725	1.8	5.6	40	120	65	56	420	5.7	502
DEC.										
12...	1500	1.2	7.4	300	120	87	69	520	5.8	649
JAN.										
19...	1345	151	4.3	300	80	44	37	230	9.0	288
MAR.										
06...	1820	111	4.5	120	40	36	27	170	10	220
APR.										
10...	1640	12	3.1	80	80	45	36	240	7.2	307
MAY										
10...	1300	31	3.2	0	60	45	36	240	8.3	286
JUNE										
14...	1150	26	3.8	110	40	48	50	280	8.4	315
JULY										
11...	1345	4.6	5.8	0	10	53	38	330	9.0	396
AUG.										
08...	1345	1.6	5.7	330	20	55	42	400	8.0	487
SEP.										
12...	1940	1.2	5.6	40	20	61	53	460	7.9	478

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
NOV.										
14...	0	412	870	7.4	.5	.23	.00	1740	2.37	8.46
DEC.										
12...	0	532	1100	8.8	.6	.23	.00	2160	2.94	7.00
JAN.										
19...	0	236	520	8.5	.2	.56	.00	974	1.32	397
MAR.										
06...	0	180	400	5.9	.1	.23	.06	771	1.05	231
APR.										
10...	0	252	530	6.1	.2	.23	.00	1040	1.42	33.7
MAY										
10...	0	235	540	6.2	.2	.23	.04	1040	1.42	87.1
JUNE										
14...	0	258	620	5.1	.3	.23	.02	1160	1.58	81.4
JULY										
11...	0	325	690	5.9	.3	.56	.05	1370	1.86	17.0
AUG.										
08...	0	399	760	6.7	.6	.43	.05	1600	2.18	6.91
SEP.										
12...	0	392	930	8.4	.3	.23	.02	1770	2.41	5.74

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
NOV.									
14...	390	0	70	9.2	2410	8.1	.5	6.4	1300
DEC.									
12...	500	0	69	10	2960	8.0	.0	10	1500
JAN.									
19...	260	26	65	6.2	1460	7.7	.0	9.2	130
MAR.									
06...	200	21	63	5.2	1160	7.3	4.0	18	300
APR.									
10...	260	9	66	6.5	1510	7.9	8.0	6.2	210
MAY									
10...	260	26	66	6.5	1520	8.1	12.5	3.6	640
JUNE									
14...	330	67	64	6.8	1670	8.1	23.0	4.0	190
JULY									
11...	290	0	71	8.5	1930	7.9	26.5	8.0	560
AUG.									
08...	310	0	73	9.9	2210	8.0	21.0	7.8	1400
SEP.									
12...	370	0	72	10	2490	8.0	19.0	7.6	1000

## JAMES RIVER BASIN

06470500 JAMES RIVER AT LA MOURE, N. DAK.

LOCATION.--Lat 46°21'20", long 98°18'15", at NE¼NE¼ of sec.11, T.133 N., R.61 W., LaMoure County, at gaging station on left bank 80 ft (24 m) downstream from bridge on State Highway 13, 0.5 mi (0.8 km) west of LaMoure, and 12 mi (19 km) upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 mi<sup>2</sup> (11,370 km<sup>2</sup>), approximately, of which about 2,600 mi<sup>2</sup> (6,730 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: September 1957 to current year (partial-record station).

Water temperatures: June 1953 to current year.

EXTREMES.--Current year:

Water temperatures: Maximum, 27.5°C July 6-7; minimum, freezing point on many days during December to April.

Period of record:

Water temperatures: Maximum, 33.0°C July 12, 13, 1957; minimum, freezing point on many days during winter months most years.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)
JAN. 16...	1100	10	28	20	1600	130	52	150	13	621
MAR. 13...	1230	63	9.8	100	210	56	23	68	8.7	280
JUNE 25...	1600	13	20	9	30	84	43	110	11	455
SEP. 24...	1700	20	20	50	67	61	32	120	11	383

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)
JAN. 16...	0	509	270	70	.5	.31	.20	1080	1.47	29.2
MAR. 13...	0	230	130	31	.4	.17	.14	473	.64	80.5
JUNE 25...	0	373	210	60	.4	.08	.09	794	1.08	27.9
SEP. 24...	13	336	160	53	.4	.02	.12	672	.91	36.3

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	DIS- SOLVED BORON (B) (UG/L)
JAN. 16...	540	29	37	2.8	1550	7.5	.0	10	470
MAR. 13...	230	5	38	1.9	762	7.7	.0	40	270
JUNE 25...	390	14	37	2.4	1170	7.7	24.0	30	440
SEP. 24...	280	0	47	3.1	1032	8.4	13.0	20	450

## JAMES RIVER BASIN

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06470500 JAMES RIVER AT LA MOURE, N. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	11.0	10.5	2.0	1.5	3.0	3.0	2.5	2.5	0.0	0.0	0.0	0.0
2	11.5	11.0	1.5	1.5	3.5	3.0	2.5	2.5	0.0	0.0	0.0	0.0
3	13.0	11.5	1.5	1.5	3.5	2.5	2.5	2.5	0.0	0.0	0.0	0.0
4	13.5	12.5	3.0	1.5	2.5	2.0	2.5	2.5	0.0	0.0	0.0	0.0
5	13.5	11.0	3.5	3.0	2.0	2.0	2.5	2.0	0.0	0.0	0.0	0.0
6	11.0	9.0	3.5	3.5	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0
7	10.5	9.0	3.5	3.0	2.0	2.0	2.0	1.5	0.0	0.0	0.0	0.0
8	10.5	9.5	3.0	3.0	2.0	2.0	1.5	1.0	0.0	0.0	0.0	0.0
9	10.0	9.0	3.0	2.5	2.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0
10	11.0	9.5	2.5	2.5	2.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0
11	11.0	10.5	2.5	2.0	2.0	2.0	1.0	0.5	0.0	0.0	0.0	0.0
12	10.5	9.0	2.0	1.5	2.0	2.0	0.5	0.5	0.0	0.0	0.0	0.0
13	9.5	9.0	1.5	1.5	2.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0
14	9.5	8.5	1.5	1.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
15	9.0	8.0	2.0	1.5	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
16	8.0	7.0	2.5	2.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
17	7.5	5.5	3.0	2.5	1.5	1.5	0.0	0.0	0.0	0.0	0.5	0.0
18	5.5	4.0	4.0	3.0	1.5	1.5	0.0	0.0	0.0	0.0	0.5	0.5
19	4.0	3.5	4.0	4.0	2.0	1.5	0.0	0.0	0.0	0.0	0.5	0.5
20	3.5	3.5	4.0	4.0	2.0	2.0	0.0	0.0	0.0	0.0	0.5	0.5
21	4.0	3.5	4.0	4.0	2.5	2.0	0.0	0.0	0.0	0.0	0.5	0.5
22	4.0	4.0	4.0	4.0	2.5	2.5	0.0	0.0	0.0	0.0	0.5	0.5
23	4.0	3.5	4.0	4.0	2.5	2.0	0.0	0.0	0.0	0.0	1.0	0.5
24	4.5	3.5	4.5	4.0	2.0	2.0	0.0	0.0	0.0	0.0	1.0	1.0
25	4.5	4.5	4.5	3.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	1.0
26	5.5	4.5	3.5	2.5	2.0	2.0	0.0	0.0	0.0	0.0	5.0	2.0
27	5.5	4.5	3.5	3.0	2.0	2.0	0.0	0.0	0.0	0.0	6.0	5.0
28	4.5	3.5	3.0	3.0	2.0	2.0	0.0	0.0	0.0	0.0	6.0	5.0
29	3.5	3.5	3.0	3.0	2.0	2.0	0.0	0.0	---	---	5.5	4.0
30	3.5	2.5	3.0	3.0	2.5	2.0	0.0	0.0	---	---	5.0	4.0
31	2.5	2.0	---	---	2.5	2.5	0.0	0.0	---	---	5.5	5.0
MONTH	13.5	2.0	4.5	1.5	3.5	1.5	2.5	0.0	0.0	0.0	6.0	0.0

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	7.5	5.5	10.0	8.5	23.5	21.5	21.5	20.5	25.0	22.0	23.5	22.5
2	8.0	6.5	10.5	7.5	23.5	23.0	23.0	21.0	25.0	21.5	23.5	22.5
3	7.5	6.0	11.5	9.0	23.0	21.5	25.0	22.0	26.0	23.0	23.0	21.0
4	8.0	6.0	12.0	11.0	21.5	19.0	26.0	23.0	23.5	23.0	21.0	20.0
5	8.0	7.5	15.5	11.0	21.0	19.0	26.0	24.5	23.5	23.0	20.0	18.5
6	8.0	7.0	15.5	13.5	22.0	19.0	27.5	25.5	24.5	23.0	22.5	18.5
7	7.0	4.5	16.5	13.5	21.5	20.0	27.5	26.5	26.0	22.0	20.5	19.5
8	4.5	3.5	19.0	14.0	23.0	20.0	27.0	25.0	26.0	23.5	19.5	19.0
9	4.0	3.0	19.0	15.5	24.5	21.5	26.5	24.5	23.0	21.0	19.5	18.5
10	5.5	3.5	15.5	14.0	24.5	22.5	26.5	25.0	23.5	21.0	20.5	19.5
11	7.5	5.0	15.0	13.5	22.5	21.0	27.0	24.5	25.0	22.0	20.5	18.5
12	8.0	6.0	13.5	11.5	24.5	20.0	27.0	25.5	26.5	23.5	20.0	18.5
13	9.5	7.0	14.0	12.0	24.0	21.0	25.5	23.0	26.0	23.5	19.0	18.0
14	12.5	9.5	14.0	12.0	24.5	22.0	23.0	21.5	25.5	23.5	18.0	16.0
15	12.5	9.0	16.0	13.0	25.5	24.0	22.5	20.5	26.0	22.5	16.0	13.5
16	10.5	7.5	15.5	13.5	25.5	24.0	22.5	20.0	26.0	24.0	14.5	12.5
17	13.5	9.0	15.0	13.5	24.0	21.5	23.5	22.0	26.5	23.5	14.5	13.0
18	13.0	11.0	17.0	15.0	22.5	19.5	25.5	22.5	26.0	24.5	14.5	13.5
19	13.0	13.0	20.0	16.5	19.5	18.0	25.5	23.5	26.0	25.0	14.0	13.5
20	13.0	12.0	20.0	18.0	18.5	17.5	25.0	23.5	25.5	21.5	13.5	12.5
21	12.0	10.0	19.5	18.5	19.5	17.0	25.0	23.5	21.5	19.5	12.5	11.5
22	10.0	8.5	20.5	17.5	23.0	19.5	24.5	22.5	20.0	19.5	11.5	11.0
23	10.5	9.0	20.0	18.5	22.5	20.5	22.5	21.5	20.0	19.0	11.5	11.0
24	10.5	9.0	19.0	16.5	22.5	21.5	24.5	21.5	20.5	19.5	13.0	11.5
25	12.0	10.0	16.5	14.5	25.0	22.5	24.5	22.5	22.5	20.5	14.5	12.5
26	11.5	10.0	15.5	15.5	23.5	22.5	23.5	21.5	22.5	21.5	15.0	14.0
27	11.0	9.0	17.0	15.5	22.5	20.5	23.5	21.5	25.5	22.5	15.5	14.5
28	10.5	9.5	18.5	16.5	22.5	20.5	22.5	21.5	25.5	24.0	16.5	15.5
29	10.5	10.0	20.5	17.5	22.0	20.5	24.5	20.5	25.5	24.0	16.5	15.5
30	10.0	10.0	22.5	19.0	22.0	20.5	24.5	22.0	25.0	24.0	16.0	15.5
31	---	---	22.0	20.0	---	---	24.0	21.5	25.0	23.5	---	---
MONTH	13.5	3.0	22.5	7.5	25.5	17.0	27.5	20.0	26.5	19.0	23.5	11.0



## 06470830 JAMES RIVER AT OAKES, N. DAK.

LOCATION.--Lat 46°08'20", long 98°06'55", in NE¼NE¼ sec.30, T.131 N., R.59 W., Dickey County, at bridge on county highway 1.0 mi (1.6 km) west of Oakes and 1.6 mi (2.6 km) downstream from Bear Creek.

DRAINAGE AREA.--5,320 mi<sup>2</sup> (13,780 km<sup>2</sup>), approximately, of which about 3,200 mi<sup>2</sup> (8,300 km<sup>2</sup>) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: July 1969 to current year.

REMARKS.--Water discharge computed by adding the estimated discharges of Cottonwood Creek and Bear Creek to the discharge of station 06470500, James River at LaMoure.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)	ALKALINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)
OCT.										
31...	0800	17	60	30	--	336	0	276	120	30
NOV.										
28...	1300	13	72	39	--	392	0	322	160	42
JAN.										
16...	1530	10	160	70	180	786	0	645	330	96
FEB.										
27...	0830	11	92	48	--	519	0	426	270	85
APR.										
03...	0800	57	47	22	50	215	0	176	120	24
MAY										
01...	1430	26	66	33	--	322	0	264	170	43
29...	1200	20	67	38	--	353	0	290	200	56
JUNE										
26...	1000	13	75	45	140	418	0	343	260	76
JULY										
31...	1015	16	61	34	--	231	39	254	240	110
AUG.										
28...	1215	12	--	--	--	--	--	--	--	--
SEP.										
25...	1200	20	60	38	130	371	0	304	220	73

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	AMMONIA NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)
OCT.										
31...	--	.00	.04	.19	.03	600	.82	27.5	270	0
NOV.										
28...	--	.21	.07	.25	.04	644	.88	22.6	340	19
JAN.										
16...	.4	.26	.11	.39	.18	1410	1.92	38.1	690	43
FEB.										
27...	--	.02	.03	.11	.05	920	1.25	27.3	430	2
APR.										
03...	.2	.81	.37	.34	.07	400	.54	61.6	210	32
MAY										
01...	--	.02	.16	.33	.03	644	.88	45.2	300	37
29...	--	.03	.19	.29	.04	716	.97	38.7	320	34
JUNE										
26...	.4	.07	.16	.40	.07	880	1.20	30.9	370	30
JULY										
31...	--	.04	.57	1.4	.46	880	1.20	38.0	290	38
AUG.										
28...	--	--	--	--	--	--	--	--	--	--
SEP.										
25...	.2	.18	.33	.41	.11	758	1.03	40.9	310	2

DATE	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	AIR TEMPERATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)
OCT.										
31...	--	790	8.4	.5	-4.0	14.3	120	7.3	540	B13
NOV.										
28...	--	1070	8.2	1.0	-6.5	15.8	120	4.6	7200	B5
JAN.										
16...	3.0	1900	7.6	.0	4.0	14.2	102	3.1	6500	<1
FEB.										
27...	--	1400	8.2	.0	.0	30.3	220	2.0	B120	B1
APR.										
03...	1.5	605	8.2	3.5	2.0	11.8	92	4.9	B3	B15
MAY										
01...	--	930	8.5	6.5	8.0	11.8	100	8.0	868	B10
29...	--	1020	8.4	18.0	21.5	8.2	90	7.1	B11	120
JUNE										
26...	3.2	1250	8.5	21.0	26.0	7.6	88	14	B1400	440
JULY										
31...	--	1180	9.4	19.5	20.0	7.2	82	>17	13500	280
AUG.										
28...	--	1550	8.7	23.5	30.0	7.8	95	>25	860	950
SEP.										
25...	3.2	1140	8.3	15.5	20.0	6.0	63	4.9	8000	1300

B - Results based on colony count outside the acceptable range.

## 06470833 PILOT DRAIN AT OAKES, N. DAK.

LOCATION.--Lat 46°07'30", long 98°05'49", in SW¼SE¼ sec.29, T.131 N., R.59 W., Dickey County, on left bank 0.5 mi (0.8 km) south and 0.4 mi (0.6 km) west of Oakes.

DRAINAGE AREA.--5.1 mi<sup>2</sup> (13.2 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: October 1971 to current year.

Specific conductance: October 1971 to current year.

Water temperature: October 1971 to current year.

## EXTREMES.--Current year:

Dissolved solids: Maximum observed, 498 mg/l Nov. 1-30, June 16-30; minimum observed, 415 mg/l July 1-31.

Hardness: Maximum observed, 360 mg/l Oct. 1 to Nov. 30; minimum observed, 300 mg/l July 1-31.

Specific conductance: Maximum daily, 830 micromhos Apr. 5, 10 and 12; minimum daily, 542 micromhos Dec. 2.

Water temperatures: Maximum daily, 26.5°C Aug. 18; minimum daily, freezing point on many days during December.

## Period of record:

Dissolved solids: Maximum, 498 mg/l Nov. 1-30, 1972; minimum, 380 mg/l Jan. 1-31, 1972.

Hardness: Maximum, 380 mg/l Oct. 1-26, 1972; minimum, 300 mg/l Mar. 1-31, 1972 and July 1-31, 1973.

Specific conductance: Maximum daily, 830 micromhos Apr. 5, 10, and 12, 1973; minimum daily, 320 micromhos Mar. 16, 1972.

Water temperatures: Maximum daily, 26.5°C Aug. 18, 1973; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during the year: Hardness 370 mg/l May 29. Minimum observed during year: Dissolved solids, 388 mg/l Sept. 24; hardness, 290 mg/l Sept. 24.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (NA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)
OCT. 01-31	2.7	90	33	18	5.7	368	0	302	472
NOV. 01-30	2.4	90	33	19	6.0	363	0	298	498
DEC. 01-31	1.3	86	34	18	4.7	354	0	290	488
JAN. 01-31	.52	86	32	15	5.1	332	0	272	439
FEB. 01-28	.33	78	29	14	5.1	331	0	271	430
MAR. 01-31	2.9	88	32	18	5.5	339	0	278	450
APR. 01-30	2.8	84	33	18	5.8	360	0	295	467
MAY 01-31	2.1	72	33	19	5.4	314	0	258	436
JUNE 01-30	1.5	69	33	18	6.0	309	0	253	426
JULY 01-31	1.1	64	33	19	6.8	306	0	251	415
AUG. 01-31	.79	75	33	19	6.2	329	0	270	460
SEP. 01-30	.61	--	--	--	--	341	0	280	--
WTD. AVG. TIME WTD. AVG.	-- 1.6	82 80	33 33	18 18	5.7 5.7	342 337	0 0	281 276	459 453
TONS PER DAY	--	.3	.1	.1	0	1.5	0	1.2	--

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
OCT. 01-31	.64	3.44	360	59	10	.4	811	7.6
NOV. 01-30	.68	3.23	360	63	10	.4	732	8.0
DEC. 01-31	.66	1.71	350	64	10	.4	664	8.1
JAN. 01-31	.60	.62	350	74	8	.4	687	8.2
FEB. 01-28	.58	.38	310	43	9	.3	621	7.9
MAR. 01-31	.61	3.52	350	73	10	.4	711	8.0
APR. 01-30	.64	3.53	350	50	10	.4	734	7.6
MAY 01-31	.59	2.47	320	58	11	.5	681	8.0
JUNE 01-30	.58	1.73	310	55	11	.4	675	8.1
JULY 01-31	.56	1.23	300	45	12	.5	666	8.1
AUG. 01-31	.63	.98	320	53	11	.5	721	8.1
SEP. 01-30	--	--	--	--	--	--	716	8.1
WTD. AVG. TIME WTD. AVG.	.62 .62	-- --	341 335	59 58	-- 10	.4 .4	718 702	7.9 8.0
TONS PER DAY	--	--	--	--	--	--	--	--

## JAMES RIVER BASIN

06470833 PILOT DRAIN AT OAKES, N. DAK.---Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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)
OCT. 30...	1730	2.8	28	--	--	--	93	32	18	5.6	355	0
NOV. 27...	1700	2.2	28	--	--	--	91	33	18	5.6	360	0
JAN. 16...	1415	.45	31	--	--	--	80	30	13	5.0	335	0
FEB. 26...	1700	.32	30	--	--	--	79	32	14	4.7	337	0
MAR. 13...	1530	2.4	24	0	20	660	79	30	15	5.5	312	0
MAY 01...	1300	2.4	28	--	--	--	93	32	19	5.9	360	0
29...	0915	1.8	29	--	--	--	93	33	18	5.7	362	0
JUNE 25...	1945	1.2	25	--	--	--	79	33	17	5.9	309	0
JULY 30...	1845	1.0	22	--	--	--	85	32	19	6.2	321	0
AUG. 27...	1900	.90	30	--	--	--	84	33	20	.9	312	0
SEP. 24...	2000	.81	27	0	10	580	76	25	16	4.9	313	0

DATE	ALKA- LINITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
OCT. 30...	291	96	14	.3	.54	.03	488	.66	3.69	360	73	10
NOV. 27...	295	97	14	.2	.59	.06	494	.67	2.93	360	68	10
JAN. 16...	275	67	11	.3	3.6	.03	430	.58	.52	320	48	8
FEB. 26...	276	65	12	.4	3.3	.02	414	.56	.36	330	53	8
MAR. 13...	256	94	15	.2	.46	.04	434	.59	2.81	320	65	9
MAY 01...	295	90	14	.1	.22	.01	482	.66	3.12	360	69	10
29...	297	97	14	.2	.38	.02	477	.65	2.32	370	71	9
JUNE 25...	253	100	16	.3	.43	.00	448	.61	1.45	330	80	10
JULY 30...	263	100	16	.2	.38	.02	454	.62	1.23	340	81	11
AUG. 27...	256	100	15	.3	.39	.00	430	.58	1.04	350	90	11
SEP. 24...	257	71	9.6	.3	.65	.05	388	.53	.85	290	36	10

DATE	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED RERYL- LIUM (BE) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT. 30...	.4	724	7.9	4.5	5	--	--	--	--	80	--	--
NOV. 27...	.4	729	7.6	2.5	4	--	--	--	--	90	--	--
JAN. 16...	.3	648	7.6	6.5	4	--	--	--	--	90	--	--
FEB. 26...	.3	656	7.6	6.0	4	--	--	--	--	80	--	--
MAR. 13...	.4	672	7.7	2.0	20	.00	3	100	0	70	0	0
MAY 01...	.4	739	7.8	7.0	20	--	--	--	--	90	--	--
29...	.4	737	7.6	13.0	20	--	--	--	--	90	--	--
JUNE 25...	.4	685	7.7	21.5	4	--	--	--	--	90	--	--
JULY 30...	.4	698	8.3	23.0	2	--	--	--	--	80	--	--
AUG. 27...	.5	688	7.9	26.5	2	--	--	--	--	80	--	--
SEP. 24...	.4	620	7.7	15.0	2	.00	9	0	0	60	0	0

DATE	DIS- SOLVED COBALT (CO) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENIUM (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)
MAR. 13...	0	2	1	20	.1	2	3	0	1	220	.0	10
SEP. 24...	0	0	2	30	.0	3	7	5	0	260	.0	10

## JAMES RIVER BASIN

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## 06470833 PILOT DRAIN AT OAKES, N. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C) , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	724	727	692	678	657	649	815	707	718	670	670	725
2	718	727	542	722	645	648	816	631	672	611	702	703
3	717	723	735	743	653	650	815	679	650	610	689	710
4	716	725	715	753	652	650	790	718	630	582	699	710
5	721	725	745	759	652	681	830	690	722	563	710	748
6	712	725	735	727	661	662	829	700	714	704	724	750
7	718	725	724	703	661	663	750	710	733	670	710	750
8	697	728	724	661	655	667	742	680	733	621	710	744
9	723	728	738	657	652	675	808	643	730	571	724	740
10	718	730	742	646	653	643	830	713	730	660	660	736
11	727	728	742	655	654	643	825	646	723	695	699	738
12	727	730	737	648	654	678	830	700	672	701	660	742
13	726	733	726	651	643	680	825	710	648	712	617	740
14	723	733	723	655	659	650	825	729	597	700	722	742
15	728	730	725	657	652	703	804	580	722	691	688	740
16	730	733	699	659	652	732	825	699	730	683	670	750
17	731	730	658	650	659	730	825	602	650	708	750	754
18	728	731	653	650	653	730	820	586	563	700	620	754
19	728	723	654	665	654	732	825	691	683	700	680	754
20	729	733	649	654	605	740	805	700	620	709	750	762
21	745	738	653	648	645	740	810	718	591	623	740	760
22	723	744	757	646	652	740	820	610	722	659	740	760
23	728	736	762	657	659	746	821	650	730	681	727	760
24	730	738	632	648	655	740	821	582	680	700	752	754
25	736	735	635	655	657	743	823	660	620	659	710	650
26	743	733	743	654	657	740	820	723	629	712	677	670
27	728	730	743	657	657	743	820	720	620	717	682	676
28	727	669	636	657	657	750	822	727	718	717	725	695
29	733	752	660	654	---	747	820	727	707	717	742	704
30	730	727	692	657	---	750	820	731	723	717	760	700
31	733	---	695	660	---	751	---	737	---	620	750	---
MONTH	726	729	699	671	652	703	814	681	679	670	705	731

TEMPERATURE (DEG. C) OF WATER , WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973  
(ONCE-DAILY MEASUREMENT)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.0	5.0	2.0	---	5.0	7.0	5.0	6.0	16.0	20.0	17.0	19.5
2	11.0	5.0	1.0	---	5.0	7.0	7.0	6.0	18.0	20.0	18.0	19.5
3	11.0	5.0	1.0	---	5.0	6.0	4.0	7.0	16.0	18.5	19.0	20.0
4	10.0	5.0	0.0	---	6.0	7.0	5.0	8.0	14.0	18.5	18.5	16.0
5	10.0	7.0	0.0	---	6.0	6.0	6.0	16.0	13.5	19.5	18.0	14.0
6	7.0	7.0	0.0	---	4.0	6.0	6.0	13.0	13.0	21.5	17.0	13.5
7	8.0	5.0	0.0	---	4.0	5.0	4.0	9.0	14.5	25.5	17.5	14.5
8	11.0	5.0	0.0	---	4.5	5.0	6.0	12.0	16.0	23.0	19.5	15.0
9	8.0	5.0	0.0	---	5.0	3.0	3.0	12.0	14.5	20.5	16.5	17.0
10	10.0	5.0	1.0	---	5.0	2.0	4.0	9.0	14.5	19.0	17.0	19.0
11	7.0	5.0	1.0	---	5.0	2.0	6.0	9.0	14.5	21.5	20.5	14.0
12	7.0	5.0	0.0	---	6.0	3.0	6.0	8.0	14.5	19.5	20.5	14.0
13	8.0	4.0	0.0	---	3.0	3.0	7.0	8.0	16.0	17.5	20.5	14.5
14	8.0	2.0	0.0	---	3.0	0.0	8.0	8.0	20.0	15.5	18.0	10.5
15	8.0	5.0	0.0	---	4.0	1.0	7.0	10.0	20.5	15.5	18.0	9.0
16	7.0	5.0	0.0	6.5	4.0	2.0	5.0	9.0	17.0	15.5	20.0	8.0
17	7.0	5.0	3.0	---	5.0	1.0	8.0	10.0	17.0	16.0	20.0	8.0
18	4.0	5.0	4.0	---	5.0	3.0	11.0	12.0	16.5	15.5	26.5	9.5
19	4.0	5.0	6.0	---	5.0	3.0	12.0	12.0	13.0	15.5	22.0	11.0
20	6.0	5.0	7.0	---	5.0	2.0	8.0	13.0	14.0	15.5	17.0	7.0
21	9.0	5.0	5.0	---	5.0	5.0	8.0	14.0	14.0	16.0	14.0	9.0
22	7.0	5.0	5.0	---	7.0	4.0	8.0	12.0	17.0	16.5	17.0	10.0
23	5.0	3.0	4.0	---	5.0	5.0	8.0	13.0	19.0	17.0	15.5	11.0
24	5.0	4.0	5.0	---	5.0	5.0	6.0	11.0	19.0	18.0	17.0	12.5
25	8.0	4.0	4.0	---	5.0	5.0	8.0	10.0	18.5	19.0	20.0	11.5
26	7.0	4.0	4.0	---	5.0	5.0	8.0	11.0	18.0	18.0	23.0	13.5
27	7.0	3.0	4.0	5.0	7.0	5.0	7.0	11.5	16.0	17.0	21.0	10.5
28	6.0	2.0	4.0	5.0	7.0	8.0	11.0	12.0	17.0	17.0	20.5	12.5
29	5.0	2.0	4.0	4.0	---	8.0	9.0	14.0	14.5	17.0	19.0	12.5
30	5.0	2.0	3.0	5.0	---	9.0	7.0	14.0	14.5	17.5	19.0	12.5
31	4.0	---	3.0	6.0	---	4.0	---	15.5	---	16.5	19.5	---
MONTH	7.5	4.5	2.5	---	5.0	4.5	7.0	11.0	16.0	18.0	19.0	13.0

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STAGE (FT ABOVE DATUM)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05056220 - SWEETWATER LAKE AT SWEETWATER, N. DAK. (LAT 48 12 37 LONG 098 52 15)

NOV., 1972												
14...	1100	a 11.52	26	0	20	20	44	39	100	24	267	11
FEB., 1973												
06...	1015	a 11.26	36	0	30	400	59	53	100	35	413	0
MAY												
16...	0845	a 11.16	17	20	20	0	39	38	71	25	282	0
AUG.												
14...	1415	a 10.53	33	0	10	150	57	43	83	11	366	0

## 05056250 - LAC AUX MORTES (LAKE ALICE) NEAR CHURCHS FERRY, N. DAK. (LAT 48 21 07 LONG 099 05 42)

NOV., 1972												
13...	1630	a 14.18	13	0	50	320	81	61	110	28	480	0
MAY, 1973												
15...	1645	a 13.78	18	0	60	140	72	55	100	33	390	0

## 05056260 - LAKE IRVINE NEAR CHURCHS FERRY, N. DAK. (LAT 48 16 57 LONG 099 10 25)

NOV., 1972												
14...	1237	a 13.27	11	0	40	20	70	59	100	33	438	0
MAY, 1973												
15...	1600	a 13.24	5.2	60	50	10	49	39	73	21	324	0

## 05056500 - DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 04 00 LONG 098 56 07)

NOV., 1972												
14...	0945	b 20.49	5.2	0	50	20	81	100	1100	120	486	49
FEB., 1973												
06...	1100	b 20.45	7.3	0	30	30	84	220	1100	150	561	63
MAY												
16...	1030	b 20.35	7.0	30	30	10	77	200	1100	130	506	47
AUG.												
14...	1500	b 19.52	16	0	20	10	80	220	1200	130	477	72

## 05056505 - NARROWS OF DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 44)

NOV., 1972												
14...	1415	b 20.49	5.6	0	30	20	80	200	960	120	481	53
FEB., 1973												
06...	1345	b 20.45	7.2	10	50	20	83	230	1100	150	571	53
MAY												
16...	1245	b 20.35	5.2	40	30	10	76	200	1040	130	479	58
AUG.												
14...	1600	b 19.52	15	10	30	10	81	220	1100	120	499	59

## 05056506 - MISSION BAY OF DEVILS LAKE NR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 43)

NOV., 1972												
14...	1455	b 16.68	8.9	0	20	0	74	220	1200	130	519	39
FEB., 1973												
06...	1330	b 16.80	13	0	60	130	99	290	1500	180	708	52
MAY												
16...	1400	b 16.60	5.7	40	30	10	69	210	1100	130	465	54
AUG.												
14...	1630	b 15.00	24	10	30	10	87	280	1500	150	601	57

## 05056563 - BLACK TIGER BAY NR TOKIO, N. DAK. (LAT 48 58 15 LONG 098 49 22)

NOV., 1972												
14...	1618	a 15.42	8.5	0	30	20	100	420	2300	250	693	46

## 05056565 - EAST BAY OUTLET OF DEVILS LAKE NR CRARY, N. DAK. (LAT 48 00 13 LONG 098 41 50)

FEB., 1973												
07...	1130	a 15.50	12	10	50	60	130	550	2900	350	944	57
MAY												
16...	1430	a 15.53	9.5	20	50	10	89	400	2100	130	641	74
AUG.												
15...	0915	a 14.45	2.8	10	40	20	56	480	2600	260	556	100

a - Feet above arbitrary datum.

b - Add 1,400.00 ft to convert to mean sea level.



ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS  
 CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	ALKA- LINITY AS CAC03 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
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PART 5. HUDSON BAY BASIN

RED RIVER OF THE NORTH BASIN

05056220 - SWEETWATER LAKE AT SWEETWATER, N. DAK. (LAT 48 12 37 LONG 098 52 15)

NOV., 1972												
14...	237	250	38	.3	.01	.16	660	.90	270	33	42	2.6
FEB., 1973												
06...	339	230	34	.4	.06	.14	848	1.15	370	27	35	2.3
MAY												
16...	231	170	23	.1	.02	.01	583	.79	250	23	35	1.9
AUG.												
14...	300	190	27	.3	.00	.17	783	1.06	320	20	35	2.0

05056250 - LAC AUX MORTES (LAKE ALICE) NEAR CHURCHS FERRY, N. DAK. (LAT 48 21 07 LONG 099 05 42)

NOV., 1972												
13...	394	240	41	.4	.02	.23	880	1.20	450	60	33	2.2
MAY, 1973												
15...	320	290	45	.2	.01	.10	864	1.18	410	87	33	2.2

05056260 - LAKE IRVINE NEAR CHURCHS FERRY, N. DAK. (LAT 48 16 57 LONG 099 10 25)

NOV., 1972												
14...	359	240	37	.4	.30	.03	812	1.10	420	58	32	2.1
MAY, 1973												
15...	266	170	29	.1	.04	.07	525	.71	280	17	34	1.9

05056500 - DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 04 00 LONG 098 56 07)

NOV., 1972												
14...	480	2100	470	.4	.04	.49	4480	6.09	610	130	76	19
FEB., 1973												
06...	565	2400	540	.5	.55	.64	5260	7.15	1100	550	65	14
MAY												
16...	493	2200	430	.2	.11	.42	4650	6.32	1000	520	67	15
AUG.												
14...	511	2500	510	.4	.00	.57	5180	7.04	1100	590	67	16

05056505 - NARROWS OF DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 44)

NOV., 1972												
14...	483	2100	460	.4	.07	.48	d 4220	5.74	1000	540	64	13
FEB., 1973												
06...	557	2400	550	.5	.55	.64	5180	7.04	1200	600	64	14
MAY												
16...	489	2200	470	.2	.18	.44	4490	6.11	1000	520	66	14
AUG.												
14...	502	2500	500	.4	.01	.55	5230	7.11	1100	600	66	14

05056506 - MISSION BAY OF DEVILS LAKE NR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 43)

NOV., 1972												
14...	491	2400	530	.4	.04	.32	5040	6.85	1100	600	68	16
FEB., 1973												
06...	667	3100	700	.7	.67	.63	6480	8.81	1400	770	66	17
MAY												
16...	471	2200	510	.4	.12	.29	4950	6.73	1000	570	67	15
AUG.												
14...	588	3200	670	.4	.01	.72	6620	9.00	1400	780	68	18

05056563 - BLACK TIGER BAY NR TOKIO, N. DAK. (LAT 48 58 15 LONG 098 49 22)

NOV., 1972												
14...	645	4800	1100	1.3	.25	.44	9500	12.9	2000	1300	69	23

05056565 - EAST BAY OUTLET OF DEVILS LAKE NR CRARY, N. DAK. (LAT 48 00 13 LONG 098 41 50)

FEB., 1973												
07...	869	6400	1500	.5	.38	.66	12700	17.3	2600	1700	68	25
MAY												
16...	649	4600	1100	.6	.06	.26	9200	12.5	1900	1200	69	21
AUG.												
15...	623	5800	1300	.9	.00	.14	11100	15.1	2100	1500	70	25

d - Calculated.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	SPECIFIC CONDUCTANCE (MICRON-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	CYANIDE (CN) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BERYLLIUM (BE) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)
PART 5. HUDSON BAY BASIN												
RED RIVER OF THE NORTH BASIN												
05056220 - SWEETWATER LAKE AT SWEETWATER, N. DAK. (LAT 48 12 37 LONG 098 52 15)												
NOV., 1972												
14...	976	8.5	1.0	30	--	0	0	--	130	1	0	1
FEB., 1973												
06...	1140	7.5	.0	20	--	5	0	--	170	0	0	1
MAY												
16...	806	8.2	9.0	40	--	4	0	--	130	0	0	0
AUG.												
14...	959	8.2	23.5	20	--	7	100	--	160	1	0	1
05056250 - LAC AUX MORTES (LAKE ALICE) NEAR CHURCHS FERRY, N. DAK. (LAT 48 21 07 LONG 099 05 42)												
NOV., 1972												
13...	1230	8.2	2.5	60	--	7	100	--	150	1	0	2
MAY, 1973												
15...	1170	8.0	15.0	50	--	6	100	--	190	0	0	0
05056260 - LAKE IRVINE NEAR CHURCHS FERRY, N. DAK. (LAT 48 16 57 LONG 099 10 25)												
NOV., 1972												
14...	1170	7.7	.5	70	--	0	0	--	160	0	0	1
MAY, 1973												
15...	835	8.2	17.0	100	--	6	0	--	120	0	0	1
05056500 - DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 04 00 LONG 098 56 07)												
NOV., 1972												
14...	5810	8.9	1.0	30	--	27	0	--	890	4	0	1
FEB., 1973												
06...	6550	8.7	.0	30	--	31	0	--	990	0	0	3
MAY												
16...	5950	8.9	9.5	30	--	26	0	--	890	0	0	0
AUG.												
14...	6150	8.9	22.5	20	--	32	0	--	960	1	0	1
05056505 - NARROWS OF DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 44)												
NOV., 1972												
14...	5770	8.7	.0	30	--	28	0	--	880	0	0	2
FEB., 1973												
06...	6450	8.5	.0	40	--	30	0	--	1000	0	0	1
MAY												
16...	5970	8.8	10.5	20	--	27	100	--	880	1	10	1
AUG.												
14...	6180	8.7	20.5	30	--	31	0	--	900	1	0	1
05056506 - MISSION BAY OF DEVILS LAKE NR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 43)												
NOV., 1972												
14...	6330	8.9	.5	40	--	29	0	--	950	1	0	1
FEB., 1973												
06...	8010	8.4	.0	40	--	34	0	--	1500	0	0	2
MAY												
16...	6280	8.6	12.5	20	--	25	0	--	930	0	0	0
AUG.												
14...	7710	8.7	22.5	50	--	62	100	--	1400	1	0	2
05056563 - BLACK TIGER BAY NR TOKIO, N. DAK. (LAT 48 58 15 LONG 098 49 22)												
NOV., 1972												
14...	12100	9.0	.0	50	--	42	0	--	2000	0	0	1
05056565 - EAST BAY OUTLET OF DEVILS LAKE NR CRARY, N. DAK. (LAT 48 00 13 LONG 098 41 50)												
FEB., 1973												
07...	14700	8.4	.0	50	--	59	0	--	2600	0	10	2
MAY												
16...	8840	8.8	12.0	70	--	24	0	--	1800	0	10	0
AUG.												
15...	12400	8.9	21.5	40	--	49	0	--	2300	1	10	2

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05056220 - SWEETWATER LAKE AT SWEETWATER, N. DAK. (LAT 48 12 37 LONG 098 52 15)

NOV., 1972											
14....	10	4	50	1.6	3	15	14	--	230	.6	90
FEB., 1973											
06....	7	2	50	.1	4	5	14	--	310	.0	40
MAY											
16....	10	0	40	.0	3	9	11	--	210	.0	10
AUG.											
14....	2	0	40	.0	2	4	11	--	330	.0	20

## 05056250 - LAC AUX MORTES (LAKE ALICE) NEAR CHURCHS FERRY, N. DAK. (LAT 48 21 07 LONG 099 05 42)

NOV., 1972											
13....	19	1	80	.2	2	15	16	--	310	.4	50
MAY, 1973											
15....	10	1	80	.0	3	28	11	--	300	.3	10

## 05056260 - LAKE IRVINE NEAR CHURCHS FERRY, N. DAK. (LAT 48 16 57 LONG 099 10 25)

NOV., 1972											
14....	11	0	90	.1	2	13	14	--	340	.2	10
MAY, 1973											
15....	10	1	50	.0	2	16	10	--	220	.3	20

## 05056500 - DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 04 00 LONG 098 56 07)

NOV., 1972											
14....	10	5	410	1.3	3	20	15	--	400	5.4	70
FEB., 1973											
06....	4	2	390	.0	5	9	15	--	400	5.3	30
MAY											
16....	10	1	400	.0	4	13	11	--	370	4.3	20
AUG.											
14....	7	0	390	.0	3	6	13	--	490	3.5	20

## 05056505 - NARROWS OF DEVILS LAKE NEAR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 44)

NOV., 1972											
14....	6	1	400	.2	3	7	11	--	380	5.8	30
FEB., 1973											
06....	4	2	430	.0	5	10	7	--	420	4.8	20
MAY											
16....	10	1	400	.0	4	7	10	--	360	2.6	20
AUG.											
14....	3	1	390	.0	3	5	15	--	470	3.4	20

## 05056506 - MISSION BAY OF DEVILS LAKE NR DEVILS LAKE, N. DAK. (LAT 48 01 36 LONG 098 53 43)

NOV., 1972											
14....	10	1	410	.2	4	11	22	--	360	6.4	20
FEB., 1973											
06....	5	1	520	.0	6	9	5	--	470	8.0	20
MAY											
16....	13	1	410	.0	6	15	14	--	330	4.3	10
AUG.											
14....	4	4	490	.0	4	7	13	--	510	6.0	20

## 05056563 - BLACK TIGER BAY NR TOKIO, N. DAK. (LAT 48 58 15 LONG 098 49 22)

NOV., 1972											
14....	11	1	730	.2	9	13	23	--	360	33	40

## 05056565 - EAST BAY OUTLET OF DEVILS LAKE NR CRARY, N. DAK. (LAT 48 00 13 LONG 098 41 50)

FEB., 1973											
07....	6	2	920	.0	13	16	20	--	950	9.6	40
MAY											
16....	10	2	710	.0	12	37	21	--	430	12	20
AUG.											
15....	4	0	800	.0	7	9	18	--	430	8.5	20

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STAGE (FT ABOVE DATUM)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05056570 - EAST DEVILS LAKE NEAR HAMAR, N. DAK. (LAT 47 57 02 LONG 098 36 34)

NOV., 1972												
14...	1715	b.40	2.4	0	50	80	13	2200	12000	1000	1140	274
FEB., 1973												
06...	1645	b.30	16	70	120	170	20	2600	11000	280	1620	285
MAY												
16...	1615	b.78	.3	80	70	20	10	2400	13000	940	1060	348
AUG.												
15...	1015	c 99.93	9.5	40	80	80	13	3100	17000	1400	2370	1060

## 05056630 - EASTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 52 04 LONG 098 21 33)

NOV., 1972												
15...	1130	c R4.49	12	0	50	100	200	5500	16000	1200	974	102
FEB., 1973												
07...	1615	--	20	0	150	750	630	13000	16000	3100	3040	0
MAY												
17...	1130	c R4.06	11	40	120	100	62	5000	24000	1000	1130	15
AUG.												
15...	1300	c R3.45	7.9	0	90	130	79	6200	30000	1500	536	235

## 05056670 - WESTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 54 48 LONG 098 23 26)

NOV., 1972												
15...	1040	c 98.49	6.8	0	30	10	110	460	2200	150	338	41
FEB., 1973												
07...	1345	c 98.51	14	0	70	40	190	960	4600	330	900	0
MAY												
17...	1045	c 98.41	10	10	20	20	120	450	2000	140	254	0
AUG.												
15...	1200	c 97.53	8.6	30	40	20	58	610	2900	190	226	79

DATE	ALKA- LINITY AS CAC03 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VEN- PHOS- (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS AC-FT)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
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## 05056570 - EAST DEVILS LAKE NEAR HAMAR, N. DAK. (LAT 47 57 02 LONG 098 36 34)

NOV., 1972												
14...	1390	29000	4500	2.0	.43	4.7	d 49600	67.5	9100	7700	72	55
FEB., 1973												
06...	1803	28000	5600	1.7	.00	.57	51500	70.0	11000	9000	68	46
MAY												
16...	1449	32000	4700	3.1	.00	.19	54700	74.4	9900	8500	72	57
AUG.												
15...	3710	36000	5900	2.2	.04	.27	70300	95.6	13000	9100	72	65

## 05056630 - EASTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 52 04 LONG 098 21 33)

NOV., 1972												
15...	969	42000	11000	2.9	.00	.59	80700	110	23000	22000	59	46
FEB., 1973												
07...	2490	54000	25000	4.3	.02	2.8	123000	167	55000	53000	37	30
MAY												
17...	952	60000	10000	5.0	.40	.68	107000	146	21000	20000	70	73
AUG.												
15...	831	76000	12000	4.2	.01	.45	137000	186	26000	25000	70	81

## 05056670 - WESTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 54 48 LONG 098 23 26)

NOV., 1972												
15...	346	5000	1100	1.3	.01	.07	9400	12.8	2200	1800	67	21
FEB., 1973												
07...	738	10000	2400	1.0	.13	.15	19700	26.8	4400	3700	67	30
MAY												
17...	208	5200	1100	1.0	.00	.07	9990	13.6	2200	1900	65	19
AUG.												
15...	317	7000	1600	.7	.00	.07	12400	16.9	2700	2300	69	24

b - Add 1,400.00 ft to convert to mean sea level.

c - Add 1,300.00 ft to convert to mean sea level.

d - Calculated.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS

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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	CYANIDE (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BERYLLIUM (BE) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05056570 - EAST DEVILS LAKE NEAR HAMAR, N. DAK. (LAT 47 57 02 LONG 098 36 34)

NOV., 1972												
14...	51000	9.0	.0	100	--	200	0	--	5900	1	0	2
FEB., 1973												
06...	39200	8.5	-2.0	100	--	300	100	--	6700	0	50	3
MAY												
16...	45600	9.0	15.5	100	--	160	0	--	6500	0	50	1
AUG.												
15...	50000	8.9	22.0	100	--	180	100	--	7500	1	80	3

## 05056630 - EASTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 52 04 LONG 098 21 33)

NOV., 1972												
15...	66000	9.1	.0	40	--	100	0	--	11000	1	0	2
FEB., 1973												
07...	76000	7.8	-4.0	100	--	7	0	--	24000	1	100	2
MAY												
17...	68900	8.5	12.0	50	--	71	0	--	9800	1	80	2
AUG.												
15...	77000	8.9	24.0	40	--	92	200	--	11000	1	130	3

## 05056670 - WESTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 54 48 LONG 098 23 26)

NOV., 1972												
15...	11300	8.7	1.0	30	--	20	0	--	1700	0	0	2
FEB., 1973												
07...	21100	8.2	-.5	50	--	43	0	--	2300	0	20	0
MAY												
17...	11000	8.3	12.0	80	--	9	0	--	1700	0	10	1
AUG.												
15...	13900	9.2	23.5	20	--	55	0	--	2400	1	10	1

DATE	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
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## 05056570 - EAST DEVILS LAKE NEAR HAMAR, N. DAK. (LAT 47 57 02 LONG 098 36 34)

NOV., 1972											
14...	10	1	4500	.2	11	22	19	--	600	73	110
FEB., 1973											
06...	1	2	980	.7	3	11	19	--	350	11	70
MAY											
16...	60	4	4400	.8	17	18	22	--	300	17	50
AUG.											
15...	90	2	4200	1.4	13	9	21	--	30	39	80

## 05056630 - EASTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 52 04 LONG 098 21 33)

NOV., 1972											
15...	5	2	7900	.1	13	27	14	--	1600	190	70
FEB., 1973											
07...	1	3	17000	.1	3	22	10	--	2500	470	200
MAY											
17...	7	3	6700	1.6	11	22	61	--	860	50	70
AUG.											
15...	160	2	7300	1.4	10	15	24	--	60	70	110

## 05056670 - WESTERN STUMP LAKE NEAR LAKOTA, N. DAK. (LAT 47 54 48 LONG 098 23 26)

NOV., 1972											
15...	4	1	820	.2	15	30	12	--	540	30	40
FEB., 1973											
07...	8	1	1600	.1	19	36	14	--	1600	13	30
MAY											
17...	6	4	790	.0	16	40	12	--	780	12	20
AUG.											
15...	6	1	1100	.0	13	14	12	--	660	14	30



## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY LAKE STATIONS

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STAGE (FT ABOVE DATUM)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MANG- NESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NESI- UM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
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## PART 6. MISSOURI RIVER BASIN

## JAMES RIVER BASIN

## 06469000 - JAMESTOWN RESERVOIR NEAR JAMESTOWN, N. DAK. (LAT 46 56 03 LONG 098 42 38)

OCT., 1972												
02...	1800	b 30.50	.7	--	40	790	42	24	52	11	252	16
JAN., 1973												
15...	1645	b 29.26	28	--	20	980	63	22	90	5.4	350	0
MAY												
08...	1000	b 30.17	.3	--	40	720	44	26	53	11	285	0
29...	0730	b 29.93	1.1	--	50	850	42	27	57	11	273	11
AUG.												
28...	1000	b 27.97	11	0	0	1300	44	27	58	14	291	0

DATE	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
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## 06469000 - JAMESTOWN RESERVOIR NEAR JAMESTOWN, N. DAK. (LAT 46 56 03 LONG 098 42 38)

OCT., 1972												
02...	233	93	13	.3	.00	.03	440	.60	200	0	34	1.6
JAN., 1973												
15...	287	140	16	.4	.03	.30	672	.91	250	0	43	2.5
MAY												
08...	234	92	14	.3	.10	.07	421	.57	220	0	33	1.6
29...	242	98	13	.3	.18	.06	415	.56	220	0	35	1.7
AUG.												
28...	239	100	14	.3	.60	.17	428	.58	220	0	35	1.7

DATE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	CYANIDE (CN) (MG/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)
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## 06469000 - JAMESTOWN RESERVOIR NEAR JAMESTOWN, N. DAK. (LAT 46 56 03 LONG 098 42 38)

OCT., 1972												
02...	614	8.4	13.0	20	--	--	--	--	190	--	--	--
JAN., 1973												
15...	815	7.6	5.5	5	--	--	--	--	270	--	--	--
MAY												
08...	636	8.3	13.5	20	--	--	--	--	150	--	--	--
29...	646	8.5	15.5	20	--	--	--	--	130	--	--	--
AUG.												
28...	678	8.0	21.5	20	.01	2	0	0	150	1	0	0

DATE	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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)
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## 06469000 - JAMESTOWN RESERVOIR NEAR JAMESTOWN, N. DAK. (LAT 46 56 03 LONG 098 42 38)

OCT., 1972											
02...	--	--	--	--	--	--	--	--	--	--	--
JAN., 1973											
15...	--	--	--	--	--	--	--	--	--	--	--
MAY											
08...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
AUG.											
28...	9	2	30	6.7	4	5	9	0	20	1.9	20

b - Add 1,400.00 ft to convert to mean sea level.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05056405 - BIG COULEE AT GRAHAMS IS INLET NR FT TOTTEN, N. DAK. (LAT 48 02 25 LONG 099 02 50)

NOV., 1972										
13...	1445	16	3.5	70	140	91	140	510	71	680
FEB., 1973										
05...	1545	5.0	12	50	920	110	260	1300	170	813
MAY										
15...	1430	E250	2.7	40	50	76	140	610	77	556
AUG.										
14...	0930	.00	24	60	870	99	240	1200	140	695

05099380 - PEMBINA RIVER NEAR VANG, N. DAK. (LAT 48 55 00 LONG 098 03 23)

DEC., 1972										
14...	1130	4.0	23	50	--	110	51	77	11	464
APR., 1973										
04...	1515	85	15	20	40	44	22	40	7.2	191
JUNE										
14...	1600	34	22	9	0	68	37	59	11	320
SEP.										
11...	1500	50	23	10	10	61	35	57	9.5	257

05099400 - LITTLE PEMBINA RIVER NEAR WALHALLA, N. DAK. (LAT 48 51 55 LONG 098 00 20)

DEC., 1972										
13...	1530	.04	21	20	30	110	29	66	8.1	339
APR., 1973										
04...	1000	7.2	20	30	50	83	23	68	7.7	237
MAY										
11...	1720	4.0	17	20	80	95	22	70	8.1	233
JUNE										
15...	1100	.64	28	20	230	99	26	66	10	291
SEP.										
12...	1100	.14	26	10	180	93	25	63	9.6	327

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)
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05056405 - BIG COULEE AT GRAHAMS IS INLET NR FT TOTTEN, N. DAK. (LAT 48 02 25 LONG 099 02 50)

NOV., 1972										
13...	31	609	970	220	.6	.01	.04	2480	3.37	107
FEB., 1973										
05...	46	743	2600	600	.6	.20	.86	5900	8.02	79.7
MAY										
15...	0	456	1400	290	.4	.14	.29	3060	4.16	--
AUG.										
14...	58	667	2500	520	.7	.10	.93	5100	6.94	.00

05099380 - PEMBINA RIVER NEAR VANG, N. DAK. (LAT 48 55 00 LONG 098 03 23)

DEC., 1972										
14...	0	381	250	19	.4	.00	.01	776	1.06	8.38
APR., 1973										
04...	0	157	120	11	.3	.03	.07	402	.55	92.3
JUNE										
14...	0	262	170	14	.4	.00	.09	562	.76	51.6
SEP.										
11...	2	214	190	14	.2	.00	.16	541	.74	73.0

05099400 - LITTLE PEMBINA RIVER NEAR WALHALLA, N. DAK. (LAT 48 51 55 LONG 098 00 20)

DEC., 1972										
13...	0	278	220	18	.4	1.3	.11	644	.88	.07
APR., 1973										
04...	0	194	230	20	.4	.46	.14	642	.87	12.5
MAY										
11...	0	191	260	23	.3	--	--	620	.84	6.70
JUNE										
15...	0	239	230	21	.9	.02	.12	657	.89	1.14
SEP.										
12...	0	268	200	17	.4	.01	.11	597	.81	.23

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY STREAM STATIONS

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	DIS- SOLVED BORON (B) (UG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05056405 - BIG COULEE AT GRAHAMS IS INLET NR FT TOTTEN, N. DAK. (LAT 48 02 25 LONG 099 02 50)

NOV., 1972									
13...	800	190	55	7.8	3340	8.4	1.5	70	370
FEB., 1973									
05...	1300	600	64	15	7460	8.4	.0	50	1100
MAY									
15...	770	310	61	9.6	3760	8.2	13.0	40	570
AUG.									
14...	1200	570	65	15	6580	8.6	21.0	90	940

05099380 - PEMBINA RIVER NEAR VANG, N. DAK. (LAT 48 55 00 LONG 098 03 23)

DEC., 1972									
14...	480	100	25	1.5	1130	7.2	.0	50	200
APR., 1973									
04...	200	44	29	1.2	573	7.7	7.0	20	20
JUNE									
14...	320	60	28	1.4	831	8.2	26.5	20	140
SEP.									
11...	300	82	29	1.4	779	8.4	18.0	20	180

05099400 - LITTLE PEMBINA RIVER NEAR WALHALLA, N. DAK. (LAT 48 51 55 LONG 098 00 20)

DEC., 1972									
13...	390	120	26	1.4	967	7.3	.0	5	140
APR., 1973									
04...	300	110	32	1.7	829	7.6	2.0	8	50
MAY									
11...	330	140	31	1.7	926	8.2	9.0	--	0
JUNE									
15...	350	120	28	1.5	944	8.1	26.0	20	150
SEP.									
12...	340	67	28	1.5	867	8.0	14.5	4	180

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

05099380 - PEMBINA RIVER NEAR VANG, N. DAK. (LAT 48 55 00 LONG 098 03 23)

DATE	TIME	TEMPER- ATURE (DEG C)	DIS- CHARGE (CFS)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT DIS- CHARGE (T/DAY)	SUS- SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM	SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .016 MM
MAR.									
16...	1210	.0	29	52	4.1	--	--	--	--
23...	1430	.0	117	337	106	57	78	94	94
APR.									
04...	1515	7.0	85	133	31	--	--	--	--
JUNE									
14...	1600	26.5	34	75	6.9	--	--	--	--
SEP.									
11...	1500	18.0	50	74	10	--	--	--	--

05099400 - LITTLE PEMBINA RIVER NEAR WALHALLA, N. DAK. (LAT 48 51 55 LONG 098 00 20)

DATE	TIME	TEMPER- ATURE (DEG C)	DIS- CHARGE (CFS)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	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
DEC.										
13...	1530	.0	.04	136	.01	--	--	--	--	--
MAR.										
13...	1700	.0	86	642	147	54	69	92	100	--
23...	1615	.0	41	466	48	50	69	92	99	100
APR.										
04...	1000	2.0	7.2	74	1.5	--	--	--	--	--
JUNE										
15...	1100	26.0	.64	66	.12	--	--	--	--	--
SEP.										
12...	1100	14.5	.14	36	.01	--	--	--	--	--

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SIO <sub>2</sub> ) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05120200 - WINTERING RIVER NEAR BERGEN, N. DAK. (LAT 47 55 50 LONG 100 40 15)

MAR., 1973												
05...	1530	28	12	50	140	50	15	9.7	71	11	176	0
<sup>a</sup> MAY												
07...	1715	.04	14	--	420	10	32	36	490	15	911	0
<sup>a</sup> JULY												
02...	1715	.28	6.8	--	1500	60	72	17	820	27	1220	0

## 05123600 - EGG CREEK NEAR GRANVILLE, N. DAK. (LAT 48 21 18 LONG 100 49 19)

OCT., 1972												
11...	0945	1.7	2.8	0	110	24	84	91	190	19	553	0
MAR., 1973												
23...	1200	5.4	7.5	0	70	50	36	29	56	16	197	0
<sup>a</sup> MAY												
10...	1000	2.4	3.2	--	60	40	73	73	130	18	448	0
<sup>a</sup> JULY												
09...	2200	9.1	11	--	150	10	26	67	83	11	345	0

## 05123700 - CUT BANK CREEK AT NORTH LAKE OUTLET NR GRANVILLE, N. DAK. (LAT 48 23 10 LONG 100 46 00)

OCT., 1972												
11...	1200	3.5	14	0	70	50	41	63	130	25	429	0
MAR., 1973												
23...	1015	5.0	6.5	0	40	30	20	24	60	12	197	0
<sup>a</sup> MAY												
10...	1130	3.4	9.8	--	80	100	47	73	140	22	449	0
<sup>a</sup> JULY												
10...	1445	6.2	7.5	--	110	70	52	85	160	23	502	0

DATE	ALKA- LITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (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)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM
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## 05120200 - WINTERING RIVER NEAR BERGEN, N. DAK. (LAT 47 55 50 LONG 100 40 15)

MAR., 1973												
05...	144	92	7.3	.4	.06	.26	354	.48	26.8	78	0	63
MAY												
07...	747	460	66	.3	--	--	1590	2.16	.17	230	0	81
JULY												
02...	1000	780	140	.7	--	--	2570	3.50	1.94	250	0	86

## 05123600 - EGG CREEK NEAR GRANVILLE, N. DAK. (LAT 48 21 18 LONG 100 49 19)

OCT., 1972												
11...	454	400	73	.8	.03	3.0	1240	1.69	5.69	580	130	40
MAR., 1973												
23...	162	160	23	.4	.08	.88	460	.63	6.71	210	48	35
MAY												
10...	367	300	53	.3	--	--	888	1.21	5.75	480	120	36
JULY												
09...	283	210	27	.2	--	--	650	.88	16.0	340	58	34

## 05123700 - CUT BANK CREEK AT NORTH LAKE OUTLET NR GRANVILLE, N. DAK. (LAT 48 23 10 LONG 100 46 00)

OCT., 1972												
11...	352	250	47	.4	.04	.06	924	1.26	8.73	360	10	42
MAR., 1973												
23...	162	100	20	.3	.01	.23	359	.49	4.85	150	0	44
MAY												
10...	368	290	51	.1	--	--	897	1.22	8.23	420	50	41
JULY												
10...	412	360	54	.2	--	--	1020	1.39	17.1	480	68	41

a - Chemical data furnished by North Dakota State Water Commission.





## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	STAGE (FT ABOVE DATUM)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ALUM- INUM- (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
PART 6. MISSOURI RIVER BASIN											
TURTLE CREEK BASIN											
06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)											
OCT., 1972											
27...	1400	1.7	--	5.7	0	310	50	14	21	1200	30
MAR., 1973											
02...	1430	26	--	9.2	170	200	20	8.3	7.0	240	13
APR.											
24...	1530	2.9	--	6.4	--	440	20	14	26	940	22
JUNE											
21...	1330	.16	--	43	--	--	480	79	25	920	26
JAMES RIVER BASIN											
06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)											
MAR., 1973											
23...	1100	.02	--	2.4	0	50	320	13	10	29	6.2
APR.											
30...	1530	.05	--	5.3	--	200	140	38	53	140	21
06470800 - HYATT SLOUGH NEAR LUDDEN, N. DAK. (LAT 45 56 18 LONG 098 09 03)											
APR., 1973											
30...	2015	--	4.80	2.4	0	100	10	44	73	360	84
TURTLE CREEK BASIN											
06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)											
OCT., 1972											
27...	1450	347	1770	1000	29	.8	--	.20	1.4	--	3720
MAR., 1973											
02...	426	26	393	200	6.7	.3	--	.26	.58	--	820
APR.											
24...	1450	144	1430	740	22	.3	.56	--	--	1.3	2800
JUNE											
21...	1310	31	1130	1100	12	.4	.23	--	--	--	2980
JAMES RIVER BASIN											
06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)											
MAR., 1973											
23...	96	0	79	48	10	.2	--	.02	.05	--	174
APR.											
30...	422	0	346	240	36	.1	.56	--	--	.10	775
06470800 - HYATT SLOUGH NEAR LUDDEN, N. DAK. (LAT 45 56 18 LONG 098 09 03)											
APR., 1973											
30...	676	46	631	290	250	.7	--	.02	.05	--	1690

a - Chemical data furnished by North Dakota State Water Commission.

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD WATER-QUALITY STREAM STATIONS  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	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)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)
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PART 6. MISSOURI RIVER BASIN  
TURTLE CREEK BASIN

06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)

OCT., 1972										
27...	5.06	17.1	120	0	94	47	4800	9.1	5.5	300
MAR., 1973										
02...	1.12	57.6	50	0	89	15	1120	8.7	.0	100
APR.										
24...	3.81	21.9	140	0	92	34	3880	9.0	11.5	--
JUNE										
21...	4.05	1.29	300	0	86	23	3880	8.5	20.0	--

JAMES RIVER BASIN

06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)

MAR., 1973										
23...	.24	.01	74	0	44	1.5	291	7.4	.5	20
APR.										
30...	1.05	.10	310	0	47	3.4	1160	7.9	9.5	--

06470880 - HYATT SLOUGH NEAR LUDDEN, N. DAK. (LAT 45 56 18 LONG 098 09 03)

APR., 1973										
30...	2.30	--	410	0	60	7.7	2320	9.0	10.0	200

DATE	TUR- RID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	CYANIDE (MG/L)	DIS- SOLVED ARSENIC (CN) (UG/L)	DIS- SOLVED BARIUM (BA) (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)
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TURTLE CREEK BASIN

06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)

OCT., 1972										
27...	80	--	--	.00	16	100	2000	1	0	1
MAR., 1973										
02...	20	--	--	.00	9	0	480	1	0	2
APR.										
24...	--	--	--	--	--	--	850	--	--	--
JUNE										
21...	--	--	--	--	--	--	250	--	--	--

JAMES RIVER BASIN

06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)

MAR., 1973										
23...	3	--	--	.00	1	0	40	1	0	0
APR.										
30...	--	--	--	--	--	--	30	--	--	--

06470880 - HYATT SLOUGH NEAR LUDDEN, N. DAK. (LAT 45 56 18 LONG 098 09 03)

APR., 1973										
30...	30	10.6	102	.00	18	0	430	0	0	1

DATE	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED MOLYB- DENUM (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 VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
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TURTLE CREEK BASIN

06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)

OCT., 1972										
27...	30	5	160	.5	5	8	15	230	16	20
MAR., 1973										
02...	8	4	30	.0	2	7	5	90	1.0	10
APR.										
24...	--	--	--	--	--	--	--	--	--	--
JUNE										
21...	--	--	--	--	--	--	--	--	--	--

JAMES RIVER BASIN

06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)

MAR., 1973										
23...	7	0	20	.2	1	2	8	90	.0	0
APR.										
30...	--	--	--	--	--	--	--	--	--	--

06470880 - HYATT SLOUGH NEAR LUDDEN, N. DAK. (LAT 45 56 18 LONG 098 09 03)

APR., 1973										
30...	10	1	20	.5	11	26	0	280	1.8	10

To obtain better coverage of the quality of water the Geological Survey during routine visits to stream-gaging stations collects specific conductance data, and periodically samples are collected for chemical analysis of major anions and cations.

# ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

### RED RIVER OF THE NORTH BASIN

05051500 - RED RIVER OF THE NORTH AT WAHPETON, N. DAK. (LAT 46 15 55 LONG 096 35 40)

NOV., 1972				
02...	1030	369	390	2.5
30...	0940	296	420	.0
JAN., 1973				
10...	1200	347	420	.0
MAR.				
08...	1140	502	470	.5
15...	1615	1180	500	2.0
APR.				
04...	1530	784	590	7.5
MAY				
02...	1430	392	420	11.0
30...	1500	446	600	21.0
JUNE				
27...	1030	211	450	23.5
JULY				
24...	1455	137	400	23.0
AUG.				
29...	1110	74	450	25.0
SEP.				
25...	1425	182	420	15.5

05051600 - WILD RICE RIVER NEAR RUTLAND, N. DAK. (LAT 46 01 20 LONG 097 30 40)

MAR., 1973				
16...	0915	.05	1310	.5
APR.				
04...	1555	6.4	1210	7.5
MAY				
02...	1305	.02	2190	15.0

05051700 - WILD RICE RIVER NEAR CAYUGA, N. DAK. (LAT 46 07 30 LONG 097 21 40)

OCT., 1972				
05...	0935	.02	3250	--
NOV.				
08...	1445	.02	3500	1.5
30...	1715	.01	--	.0
MAR., 1973				
06...	1820	.20	--	.0
APR.				
04...	1700	4.4	1060	9.0
MAY				
02...	1200	.47	1550	9.0
JUNE				
12...	1640	16	1500	20.5
JULY				
10...	1800	.10	--	29.0

05055520 - BIG COULEE NR FT. TOTTEN, N. DAK. (LAT 47 52 57 LONG 098 58 02)

OCT., 1972				
03...	1840	.58	590	13.0
NOV.				
01...	1630	.75	660	3.5
28...	1150	.62	575	.0
JAN., 1973				
17...	1605	.43	590	1.5
FEB.				
27...	0935	.43	540	.0
MAR.				
08...	1440	4.1	390	.0
13...	1745	6.0	355	.0
22...	1415	1.7	440	2.0
APR.				
05...	1110	1.2	450	3.5
MAY				
02...	1500	1.6	500	10.5
30...	0850	2.0	640	13.0
JUNE				
27...	1615	.64	680	20.5
JULY				
25...	1100	.37	660	16.0
SEP.				
05...	1555	.31	620	17.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05056100 - MAUVAIS COULEE NEAR CANDU, N. DAK. (LAT 48 26 53 LONG 099 06 08)

OCT., 1972				
04...	1500	.07	1195	14.5
NOV.				
02...	1225	.08	1620	5.0
29...	0930	.12	1590	.0
MAR., 1973				
14...	1715	7.7	570	.0
22...	0945	18	770	.0
APR.				
05...	0920	2.2	800	6.5
MAY				
01...	1700	.23	--	12.5

05056200 - EDMORE COULEE NEAR EDMORE, N. DAK. (LAT 48 20 14 LONG 098 39 33)

MAR., 1973				
21...	1135	34	390	.0
APR.				
04...	1020	4.4	600	6.0
MAY				
01...	1100	.17	800	6.0

05057200 - BALDHILL CREEK NEAR DAZEY, N. DAK. (LAT 47 13 45 LONG 098 07 28)

OCT., 1972				
04...	1405	2.2	880	--
NOV.				
07...	1540	3.3	800	1.0
DEC.				
01...	1135	2.8	940	--
FEB., 1973				
06...	1520	1.8	900	.0
MAR.				
13...	1130	12	530	.5
22...	1415	27	560	.0
APR.				
05...	1055	8.0	680	7.5
MAY				
02...	0915	5.8	970	6.5
JUNE				
06...	1805	3.8	980	21.5
JULY				
03...	1430	1.4	1030	22.5
AUG.				
08...	1330	.49	1200	20.0
SEP.				
06...	1330	1.6	--	17.0

05058000 - SHEYENNE RIVER BELOW BALDHILL DAM, N. DAK. (LAT 47 01 50 LONG 098 05 50)

OCT., 1972				
05...	0855	11	670	10.5
NOV.				
07...	1710	52	600	2.0
DEC.				
01...	1100	49	640	1.0
FEB., 1973				
06...	1350	67	740	2.5
MAR.				
13...	0925	30	880	2.5
APR.				
04...	1655	77	560	6.5
MAY				
01...	1700	9.3	740	10.0
JUNE				
06...	1435	21	700	21.0
JULY				
03...	1600	12	710	24.5
AUG.				
08...	1200	18	680	22.0
SEP.				
06...	1200	16	680	21.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
RED RIVER OF THE NORTH BASIN

05058500 - SHEYENNE RIVER AT VALLEY CITY, N. DAK. (LAT 46 54 50 LONG 098 00 30)

OCT., 1972				
04...	1830	16	615	13.5
NOV.				
08...	0905	49	620	2.0
DEC.				
01...	0910	59	650	.0
FEB., 1973				
05...	1640	63	700	.0
MAR.				
12...	1710	64	600	2.0
APR.				
05...	0905	89	790	7.5
MAY				
01...	1530	15	800	10.5
JUNE				
06...	1310	16	790	19.5
JULY				
10...	1200	8.8	770	25.5
AUG.				
08...	1015	20	700	22.0
SEP.				
06...	1020	17	640	18.5

05059000 - SHEYENNE RIVER NEAR KINDRED, N. DAK. (LAT 46 37 35 LONG 097 00 05)

OCT., 1972				
04...	1155	56	800	12.5
NOV.				
02...	1525	70	860	2.0
30...	1320	67	900	.0
FEB., 1973				
08...	1400	94	930	.0
MAR.				
08...	1410	184	730	.0
23...	1350	506	560	.5
APR.				
03...	1540	222	720	5.0
MAY				
01...	1545	88	900	9.0
JUNE				
11...	1620	54	950	21.0
JULY				
11...	1530	37	900	27.0
AUG.				
08...	1325	31	800	25.0
SEP.				
07...	0915	35	850	17.5

05059500 - SHEYENNE RIVER AT WEST FARGO, N. DAK. (LAT 46 53 28 LONG 096 54 24)

OCT., 1972				
03...	1725	52	820	12.5
31...	1710	58	870	2.0
NOV.				
29...	1150	79	950	.0
FEB., 1973				
07...	1450	91	990	.0
MAR.				
08...	1140	161	770	.0
16...	1715	396	610	.0
19...	1305	338	580	.0
22...	1300	338	580	.0
APR.				
03...	1130	235	710	4.5
MAY				
01...	1220	92	950	9.5
JUNE				
11...	1320	66	980	21.0
JULY				
13...	1100	38	960	23.0
AUG.				
08...	0950	32	720	23.0
SEP.				
07...	1030	41	810	17.0

05059600 - MAPLE RIVER NEAR HOPE, N. DAK. (LAT 47 19 30 LONG 097 47 25)

MAR., 1973				
13...	1535	7.9	460	1.0
19...	1610	4.8	700	1.0
APR.				
05...	1225	.03	1080	8.5



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05060000 - MAPLE RIVER NEAR MAPLETON, N. DAK. (LAT 46 51 40 LONG 097 06 10)

NOV., 1972				
02...	1710	13	1300	1.5
29...	1600	11	1640	.0
FEB., 1973				
05...	1340	4.9	1800	.0
MAR.				
12...	1410	120	520	--
16...	1645	1100	--	.0
19...	1420	550	680	.0
23...	1600	688	740	2.5
APR.				
04...	0900	151	1180	4.5
MAY				
01...	1030	30	1630	7.5
JUNE				
06...	1105	12	1420	16.0
JULY				
13...	1300	.99	1440	22.5
AUG.				
07...	1700	2.3	1300	25.5
SEP.				
05...	1625	6.1	1100	19.0

## 05060500 - RUSH RIVER AT AMENIA, N. DAK. (LAT 47 01 00 LONG 097 12 50)

OCT., 1972				
31...	1510	.93	1340	2.5
NOV.				
29...	1400	.60	2080	.0
MAR., 1973				
05...	1715	18	1400	.0
12...	1150	28	485	.0
20...	1235	40	560	.0
22...	1125	37	600	.5
APR.				
04...	1310	4.4	1080	9.5
MAY				
01...	1300	2.0	1570	9.5
JUNE				
05...	1720	.31	1600	19.0
SEP.				
05...	1330	48	530	18.5

## 05064500 - RED RIVER OF THE NORTH AT HALSTAD, MINN. (LAT 47 21 10 LONG 096 50 50)

OCT., 1972				
03...	1425	560	620	13.0
NOV.				
03...	1355	682	540	3.0
28...	1210	443	560	.0
FEB., 1973				
07...	1200	619	640	.0
MAR.				
09...	1240	1160	--	.0
17...	1340	6070	400	.0
22...	1530	5140	--	.0
APR.				
02...	1535	2110	770	5.5
30...	1325	993	640	10.5
JUNE				
08...	1340	748	800	20.5
JULY				
09...	1530	404	570	28.0
AUG.				
08...	1610	296	530	25.0
SEP.				
04...	1400	1560	355	--

## 05065500 - GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20 LONG 097 27 20)

OCT., 1972				
03...	1235	.01	1260	14.0
NOV.				
27...	1255	.15	1500	.0
MAR., 1973				
09...	1320	5.0	--	.0
17...	1135	151	500	.0
22...	1730	48	570	.0
APR.				
05...	1500	17	680	8.0
MAY				
02...	1600	2.4	1120	11.0
JUNE				
05...	1135	.80	1180	17.0
JULY				
09...	1100	.20	1030	23.5
AUG.				
07...	1125	.01	980	23.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
RED RIVER OF THE NORTH BASIN

05066500 - GOOSE RIVER AT HILLSBORO, N. DAK. (LAT 47 24 20 LONG 097 03 40)

OCT., 1972				
03...	1235	.75	1500	11.5
NOV.				
03...	1210	7.1	1720	1.5
27...	1450	7.7	1650	.0
FEB., 1973				
05...	1445	3.6	2060	.0
MAR.				
07...	1600	34	1880	.0
16...	1855	1260	480	.0
22...	1700	276	630	1.0
APR.				
02...	1340	95	810	4.0
30...	1425	23	1250	10.5
JUNE				
08...	1150	11	1410	18.5
JULY				
09...	1300	2.8	1750	25.0
AUG.				
08...	1730	1.6	1400	23.0
SEP.				
04...	1615	1.8	1160	20.5

05083600 - MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, N. DAK. (LAT 48 14 50 LONG 098 07 00)

MAR., 1973				
13...	1040	.63	--	.0
19...	1300	.36	380	.0
23...	1425	.48	--	.5

05084000 - FOREST RIVER NEAR FORDVILLE, N. DAK. (LAT 48 11 50 LONG 097 43 49)

OCT., 1972				
10...	1245	6.9	610	6.0
NOV.				
09...	1025	9.2	580	1.0
DEC.				
19...	1240	4.4	700	.0
FEB., 1973				
15...	1730	11	620	.0
MAR.				
09...	1200	24	390	.0
19...	1145	32	480	--
23...	1310	97	350	.5
APR.				
02...	1630	20	590	8.5
MAY				
07...	1445	12	620	14.0
JUNE				
13...	1100	7.1	660	16.0
JULY				
12...	1205	4.0	--	26.0
AUG.				
14...	1245	4.6	600	20.5
SEP.				
14...	1410	4.1	610	13.5

05085000 - FOREST RIVER AT MINTO, N. DAK. (LAT 48 16 10 LONG 097 22 10)

OCT., 1972				
13...	1630	6.2	--	9.0
NOV.				
07...	0850	6.4	630	.5
DEC.				
12...	1020	1.6	1000	.0
FEB., 1973				
05...	1600	.42	--	.0
12...	1615	.67	1700	.0
MAR.				
07...	1025	9.9	1020	.0
12...	1620	101	460	.0
APR.				
03...	1015	62	525	1.0
MAY				
08...	1115	15	700	12.5
JUNE				
12...	1600	8.6	750	20.5
JULY				
10...	1410	7.7	750	24.5
AUG.				
13...	1610	5.0	780	22.5
SEP.				
17...	1215	.45	690	12.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05089000 - SOUTH BRANCH PARK RIVER BELOW HOMME DAM, N. DAK. (LAT 48 24 07 LONG 097 46 55)

OCT., 1972				
10...	1615	.34	610	11.0
NOV.				
09...	1245	6.7	510	2.0
DEC.				
13...	1135	2.1	700	--
FEB., 1973				
12...	1445	12	640	2.0
21...	1010	27	610	2.0
MAR.				
15...	1415	.99	--	2.5
APR.				
05...	1600	13	410	7.0
MAY				
08...	1425	2.0	540	16.0
JUNE				
13...	1600	2.8	570	23.0
JULY				
12...	0925	2.5	590	22.0
AUG.				
14...	1520	1.8	600	23.5
SEP.				
14...	1540	2.2	600	15.0

05089100 - MIDDLE BRANCH PARK RIVER NEAR UNION, N. DAK. (LAT 48 32 32 LONG 098 01 10)

NOV., 1972				
08...	1630	.03	650	.0
MAR., 1973				
06...	1325	.92	260	.0
13...	1110	14	--	.0
19...	1430	2.4	260	.0
22...	1730	15	210	--
APR.				
05...	1330	.31	495	9.5
MAY				
08...	1535	.05	620	19.0
SEP.				
12...	1700	.10	630	17.5

05089500 - CART CREEK AT MOUNTAIN, N. DAK. (LAT 48 40 37 LONG 097 51 41)

OCT., 1972				
11...	1500	.24	810	7.0
NOV.				
08...	1545	.27	820	.0
MAR., 1973				
06...	1600	.60	540	.0
13...	1225	14	--	.0
19...	1550	5.6	530	.0
22...	1900	16	360	.0
APR.				
05...	1030	1.6	780	5.0
MAY				
08...	1710	.43	910	18.0
JUNE				
14...	1255	.02	990	21.5

05090000 - PARK RIVER AT GRAFTON, N. DAK. (LAT 48 25 24 LONG 097 24 30)

OCT., 1972				
13...	1430	.01	1250	7.5
NOV.				
07...	0920	.01	1390	--
DEC.				
12...	1100	.10	1110	.0
MAR., 1973				
02...	1150	9.1	--	.0
12...	1500	2.0	850	.0
22...	1130	82	690	.0
APR.				
03...	1155	44	510	.5
MAY				
08...	1200	3.5	900	12.0
JUNE				
12...	1315	2.1	1150	20.0
JULY				
10...	1250	.08	--	25.0
AUG.				
13...	1510	.94	1080	23.0
SEP.				
17...	1305	.08	1180	14.0

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
RED RIVER OF THE NORTH BASIN

05092000 - RED RIVER OF THE NORTH AT DRAYTON, N. DAK. (LAT 48 34 20 LONG 097 08 50)

OCT., 1972				
13...	1310	1800	400	9.5
NOV.				
07...	1205	1940	480	.5
DEC.				
12...	1715	1170	700	--
FEB., 1973				
12...	1155	1240	590	.0
MAR.				
12...	1315	2180	700	.0
APR.				
03...	1405	4120	720	5.0
MAY				
09...	1120	1400	750	14.5
JUNE				
18...	1150	1100	630	21.0
JULY				
10...	1125	578	--	25.0
AUG.				
13...	1320	950	620	23.0
SEP.				
17...	1550	2940	495	15.0

05092200 - PEMBINA COUNTY DRAIN 20 NEAR GLASSTON, N. DAK. (LAT 48 41 49 LONG 097 23 03)

MAR., 1973				
20...	1830	.33	350	--

05098700 - HIDDEN ISLAND COULEE NEAR HANSBORN, N. DAK. (LAT 48 57 10 LONG 099 25 35)

MAR., 1973				
07...	1405	.60	425	.0
14...	1500	1.6	580	.5
21...	1555	.91	615	2.0
MAY				
01...	1500	.01	1200	12.0
30...	1625	.02	--	19.0
JUNE				
28...	1445	9.5	1000	19.0

05098800 - LONG RIVER (CYPRESS CREEK) NEAR SARLES, N. DAK. (LAT 48 56 35 LONG 098 57 05)

MAR., 1973				
14...	1310	13	470	.5
21...	1420	1.5	550	5.0

05099380 - PEMBINA RIVER NEAR VANG, N. DAK. (LAT 48 55 00 LONG 098 03 23)

DEC., 1972				
14...	1130	4.0	1080	.0
APR., 1973				
04...	1515	85	580	7.0
JUNE				
14...	1600	34	840	26.5
SEP.				
11...	1500	50	730	18.0

05099400 - LITTLE PEMBINA RIVER NEAR WALHALLA, N. DAK. (LAT 48 51 55 LONG 098 00 20)

OCT., 1972				
12...	1120	.79	710	7.0
NOV.				
08...	0955	1.4	860	.5
DEC.				
13...	1530	.04	810	.0
MAR., 1973				
13...	1700	86	410	.0
16...	0900	4.7	610	.0
20...	1010	14	660	.0
23...	1615	41	530	.0
APR.				
04...	1000	7.2	880	2.0
MAY				
11...	1720	4.0	910	9.0
JUNE				
15...	1100	.64	900	26.0
JULY				
11...	1445	.35	900	28.5
AUG.				
15...	1105	.37	870	21.5
SEP.				
12...	1100	.14	850	14.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05100000 - PEMBINA RIVER AT NECHE, N. DAK. (LAT 48 59 20 LONG 097 33 05)

OCT., 1972				
12...	1600	88	670	7.5
NOV.				
07...	1445	51	690	--
DEC.				
12...	1415	9.3	1100	.0
FEB., 1973				
20...	1445	2.7	1050	.0
MAR.				
13...	1100	22	--	.0
20...	1720	146	480	.0
APR.				
03...	1755	130	630	3.5
MAY				
09...	1320	72	800	15.0
JUNE				
12...	1100	44	840	18.5
JULY				
11...	1805	36	--	27.0
AUG.				
15...	1500	66	610	24.5
SEP.				
11...	1720	57	740	18.5

05100500 - HERZOG CREEK NEAR CONCRETE, N. DAK. (LAT 48 45 13 LONG 097 54 22)

OCT., 1972				
12...	1320	.03	650	8.0
NOV.				
08...	1310	.24	690	.0
MAR., 1973				
07...	1400	.03	--	.0
13...	1340	.75	--	.0
19...	1640	.10	650	.0
APR.				
05...	1015	.11	660	2.5
MAY				
08...	1730	.02	760	20.0
JUNE				
14...	1330	.03	740	20.0
JULY				
11...	1105	.01	--	25.0
AUG.				
14...	1730	.01	700	21.5

05101000 - TONGUE RIVER AT AKRA, N. DAK. (LAT 48 46 40 LONG 097 42 55)

OCT., 1972				
12...	1430	1.9	560	7.0
NOV.				
08...	1445	4.3	550	.0
DEC.				
18...	1625	3.1	650	.5
FEB., 1973				
15...	1400	3.8	580	.5
MAR.				
13...	1440	25	--	.5
19...	1735	29	430	2.0
APR.				
05...	0820	16	440	3.5
MAY				
09...	1630	5.2	520	11.5
JUNE				
15...	0930	3.8	570	20.5
JULY				
11...	1200	3.7	560	25.0
AUG.				
15...	1000	.21	500	18.5
SEP.				
12...	0935	.42	505	10.0



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
RED RIVER OF THE NORTH BASIN

05113600 - LONG CREEK NEAR NOONAN, N. DAK. (LAT 48 58 52 LONG 103 04 34)

OCT., 1972				
03...	1300	1.2	1280	13.0
NOV.				
07...	1230	1.5	1410	2.0
DEC.				
06...	1330	1.0	1490	.0
JAN., 1973				
11...	1045	.55	1750	.0
FEB.				
06...	1125	.62	1290	.0
27...	1345	.57	1340	.0
MAR.				
07...	1215	1.4	1090	.5
21...	1105	6.3	925	2.5
APR.				
03...	1530	14	1080	7.0
MAY				
01...	1015	10	1640	8.0
JUNE				
06...	1105	6.9	1650	19.0
JULY				
03...	1630	.19	1990	24.0
AUG.				
01...	0930	.03	1900	23.0
SEP.				
05...	1325	.18	1690	20.0

05114000 - SOURIS (MOUSE) RIVER NEAR SHERWOOD, N. DAK. (LAT 48 59 24 LONG 101 57 28)

OCT., 1972				
04...	1210	10	1050	10.0
NOV.				
09...	1610	40	1110	.0
DEC.				
06...	1715	6.6	1820	.0
JAN., 1973				
06...	1310	16	2160	.0
MAR.				
06...	1745	14	1040	--
11...	1245	67	1300	.0
15...	1450	106	1000	.0
21...	1225	71	850	.0
APR.				
03...	1315	38	840	.5
MAY				
08...	1200	27	1100	12.0
JUNE				
05...	1645	22	1120	15.5
JULY				
03...	1215	10	1420	18.5
AUG.				
07...	1015	1.5	1290	17.5

05116500 - DES LACS RIVER AT FOXHOLM, N. DAK. (LAT 48 22 14 LONG 101 34 11)

OCT., 1972				
06...	1515	64	1180	8.5
NOV.				
09...	1335	34	1400	1.0
DEC.				
05...	1450	3.2	2200	.0
JAN., 1973				
09...	1525	1.4	1980	.0
MAR.				
07...	1405	43	440	.0
12...	1715	112	500	.0
15...	1040	26	820	.0
20...	1745	30	1070	.0
APR.				
03...	1630	16	1390	7.5
MAY				
11...	1130	13	1780	9.5
JUNE				
08...	1155	19	--	18.0
JULY				
05...	1015	7.9	1580	21.0
AUG.				
06...	1625	2.6	1490	22.5
30...	1405	5.2	2420	21.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
 RED RIVER OF THE NORTH BASIN

05117500 - SOURIS (MOUSE) RIVER ABOVE MINOT, N. DAK. (LAT 48 14 45 LONG 101 22 15)

OCT., 1972				
06...	1150	169	900	8.5
NOV.				
09...	1035	94	940	1.0
DEC.				
05...	1145	49	520	.0
JAN., 1973				
08...	1740	44	900	.0
MAR.				
07...	1105	163	620	.0
12...	1135	218	530	.0
15...	0935	83	530	.0
20...	1550	33	620	.0
APR.				
04...	0940	22	870	5.0
MAY				
11...	1000	20	1670	12.0
JUNE				
08...	0955	47	1400	17.5
JULY				
05...	0800	7.9	--	20.5
AUG.				
03...	1100	3.0	1120	22.0
SEP.				
07...	1135	48	1600	16.0

05120200 - WINTERING RIVER NEAR BERGEN, N. DAK. (LAT 47 55 50 LONG 100 40 15)

MAR., 1973				
05...	1530	28	350	.0
10...	1240	10	700	3.0
APR.				
02...	1355	1.5	1620	9.5
MAY				
07...	1715	.04	2300	16.5
JULY				
02...	1715	.28	3500	23.0

05120500 - WINTERING RIVER NEAR KARLSRUHE, N. DAK. (LAT 48 10 14 LONG 100 32 20)

OCT., 1972				
02...	1820	4.4	650	13.5
NOV.				
08...	1040	3.3	680	1.0
DEC.				
04...	1440	2.4	850	.0
MAR., 1973				
10...	1445	10	325	.0
14...	1720	6.1	350	.0
16...	1320	2.8	--	.0
APR.				
02...	1730	16	730	8.0
MAY				
11...	1340	8.3	825	9.5
JUNE				
04...	1715	4.5	830	15.5
JULY				
05...	1400	4.1	670	22.5
AUG.				
09...	1415	2.6	590	19.5
SEP.				
10...	1640	2.2	600	20.0

## SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05122000 - SOURIS (MOUSE) RIVER NEAR BANTRY, N. DAK. (LAT 48 30 20 LONG 100 26 04)

OCT., 1972				
05...	1110	154	940	10.0
NOV.				
07...	1020	178	920	1.0
DEC.				
07...	1130	53	720	.0
JAN., 1973				
12...	1735	59	940	.0
MAR.				
09...	1500	71	760	.0
14...	1530	41	670	.0
22...	1625	40	510	.0
APR.				
09...	1650	50	670	6.5
MAY				
10...	1500	353	950	13.5
JUNE				
07...	1505	43	1090	17.5
JULY				
04...	1945	94	900	23.5
AUG.				
08...	1315	21	910	21.0
SEP.				
13...	1440	68	970	16.0

05123100 - OAK CREEK AT LAKE METIGOSHE OUTLET NEAR BOTTINEAU, N. DAK. (LAT 48 57 56 LONG 100 21 47)

SEP., 1973				
06...	0955	.86	440	16.0

05123400 - WILLOW CREEK NEAR WILLOW CITY, N. DAK. (LAT 48 35 20 LONG 100 26 30)

OCT., 1972				
04...	1740	.01	1080	13.5
NOV.				
07...	1240	1.0	1180	3.0
MAR., 1973				
13...	1730	.03	--	.0
22...	1450	13	770	2.5
APR.				
09...	1820	3.6	970	7.5
MAY				
09...	1730	11	1360	14.0
JUNE				
07...	1610	1.0	1670	17.0
JULY				
04...	1745	11	1760	23.5
AUG.				
08...	1340	.03	1430	21.0

05123510 - DEEP RIVER NEAR UPHAM, N. DAK. (LAT 48 35 03 LONG 100 51 44)

MAY, 1973				
04...	1040	.74	800	9.5
JUNE				
01...	1025	.69	795	18.0
JULY				
04...	1145	.18	740	22.5
AUG.				
09...	1010	.14	820	17.0
SEP.				
12...	1720	.12	760	17.0

05123600 - EGG CREEK NEAR GRANVILLE, N. DAK. (LAT 48 21 18 LONG 100 49 19)

OCT., 1972				
11...	0945	1.7	1750	6.0
NOV.				
08...	1535	1.4	1710	1.0
DEC.				
04...	1700	.31	2150	.0
MAR., 1973				
14...	1040	5.3	800	.0
23...	1200	5.4	660	2.0
APR.				
06...	1155	1.8	1070	4.0
MAY				
10...	1000	2.4	1300	9.0
JUNE				
07...	0930	.04	1680	15.0
JULY				
09...	2200	9.1	950	26.5
AUG.				
13...	1510	.02	1190	26.5
SEP.				
12...	1945	4.2	1420	19.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 5. HUDSON BAY BASIN  
 RED RIVER OF THE NORTH BASIN

05123700 - CUT BANK CREEK AT NORTH LAKE OUTLET NEAR GRANVILLE, N. DAK. (LAT 48 23 10 LONG 100 46 00)

OCT., 1972				
11...	1200	3.5	1300	6.0
NOV.				
08...	1620	3.8	1350	2.5
DEC.				
08...	1040	2.2	2080	.0
MAR., 1973				
14...	1120	.03	430	--
22...	1830	5.1	550	4.5
23...	1015	5.0	540	3.0
APR.				
06...	1035	4.7	830	6.0
MAY				
10...	1130	3.4	1280	11.0
JUNE				
07...	1130	1.1	1500	13.5
JULY				
10...	1445	6.2	1420	25.5
AUG.				
13...	1615	.31	1570	28.0
SEP.				
13...	1300	.24	1620	15.5

05123900 - BOUNDARY CREEK NEAR LANDA, N. DAK. (LAT 48 48 46 LONG 100 51 46)

MAR., 1973				
08...	1140	1.8	480	.0
13...	1500	9.2	390	1.0
21...	1625	2.2	700	3.5
APR.				
10...	0900	.04	1030	3.5
MAY				
09...	1145	.20	1260	11.5
JUNE				
06...	1200	.08	1260	17.5
JULY				
04...	1315	1.1	1240	22.0
SEP.				
06...	1330	56	535	17.0

PART 6. MISSOURI RIVER BASIN  
 YELLOWSTONE RIVER BASIN

06329597 - CHARBONNEAU CREEK NEAR CHARBONNEAU, N. DAK. (LAT 47 51 10 LONG 103 47 40)

OCT., 1972				
04...	1540	.63	2520	12.0
NOV.				
08...	0950	.97	2680	3.0
DEC.				
07...	1545	.57	3100	.0
FEB., 1973				
08...	1100	.65	1600	.0
MAR.				
01...	1215	152	--	1.0
05...	1515	40	295	1.0
13...	1735	9.5	840	.5
21...	1435	2.7	1200	4.0
APR.				
04...	1630	1.7	1800	9.5
MAY				
01...	1520	2.2	2120	12.0
JUNE				
08...	0955	1.7	2550	18.0
JULY				
05...	0935	.69	1575	23.0
AUG.				
02...	1345	.23	2040	24.0
SEP.				
07...	1135	2.0	1840	16.5

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

WHITE EARTH RIVER BASIN

06332000 - WHITE EARTH RIVER AT WHITE EARTH, N. DAK. (LAT 48 22 35 LONG 102 46 00)

OCT., 1972				
03...	0925	17	1390	9.0
NOV.				
06...	1620	13	1660	3.0
DEC.				
07...	0955	1.4	1450	.0
JAN., 1973				
10...	1500	.94	1890	.0
FEB.				
05...	1650	1.8	1680	.0
27...	0935	3.6	1120	1.0
MAR.				
06...	1115	33	740	.5
12...	1645	119	1190	1.0
20...	1620	68	1370	2.0
APR.				
02...	1630	30	1430	6.0
30...	1600	27	1510	10.0
JUNE				
05...	1705	23	1820	19.0
JULY				
02...	1640	2.9	1970	20.0
31...	1445	1.2	2080	23.0
SEP.				
04...	1525	11	1890	17.0

SHELL CREEK BASIN

06332520 - SHELL CREEK NEAR PARSHALL, N. DAK. (LAT 48 03 11 LONG 102 08 10)

OCT., 1972				
02...	1325	5.1	2420	13.0
NOV.				
06...	1355	5.5	2510	2.0
DEC.				
04...	1445	2.0	2700	.0
FEB., 1973				
26...	1640	.42	860	.5
MAR.				
06...	1350	18	1000	.5
12...	1400	47	1940	1.0
20...	1415	14	1850	2.5
APR.				
02...	1415	11	1900	6.5
30...	1335	13	2390	9.0
JUNE				
05...	1345	30	1850	17.0
JULY				
02...	1425	10	2390	19.0
31...	1240	2.4	2520	23.0
SEP.				
04...	1305	5.7	2550	17.5

LITTLE MISSOURI RIVER BASIN

06335000 - LITTLE BEAVER CREEK NEAR MARMARTH, N. DAK. (LAT 46 16 29 LONG 103 58 33)

OCT., 1972				
11...	1100	6.7	1400	7.0
NOV.				
14...	1005	6.8	1410	.0
DEC.				
13...	1115	2.7	1800	.0
JAN., 1973				
18...	1140	178	630	1.0
FEB.				
07...	1120	9.4	1290	.0
28...	1100	122	815	.5
MAR.				
07...	1050	35	940	1.0
14...	1045	35	1160	.5
APR.				
11...	0935	14	1490	5.5
MAY				
09...	1015	16	1495	17.0
JUNE				
13...	0925	17	1325	18.5
JULY				
10...	1030	14	1360	24.5
AUG.				
08...	0800	5.6	1750	18.0
SEP.				
12...	1255	9.6	1130	18.0



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 6. MISSOURI RIVER BASIN

## LITTLE MISSOURI RIVER BASIN

06335500 - LITTLE MISSOURI RIVER AT MARMARTH, N. DAK. (LAT 46 17 44 LONG 103 55 06)

OCT., 1972				
11...	1425	40	1490	8.0
NOV.				
14...	1330	26	1690	.5
DEC.				
13...	1605	9.1	2540	.0
JAN., 1973				
18...	1525	971	680	.5
MAR.				
07...	1405	364	660	.5
14...	1310	426	930	.5
APR.				
11...	1145	71	1660	10.5
MAY				
09...	1255	160	1270	14.0
JUNE				
13...	1320	164	1305	24.5
JULY				
10...	1210	95	1350	25.0
AUG.				
07...	1615	35	1850	25.0
SEP.				
12...	1015	30	1650	14.0

06336000 - LITTLE MISSOURI RIVER AT MEDORA, N. DAK. (LAT 46 55 10 LONG 103 31 40)

OCT., 1972				
24...	1400	56	2080	7.0
NOV.				
24...	1200	53	2110	.5
DEC.				
18...	1540	6.3	2700	.0
FEB., 1973				
20...	1610	36	2000	.0
MAR.				
02...	1300	2110	560	2.0
05...	1655	991	630	1.0
12...	1355	805	900	2.0
APR.				
19...	1320	104	2150	12.0
MAY				
22...	1355	68	1900	17.5
JUNE				
21...	1400	2420	1900	17.0
JULY				
19...	1240	62	1700	23.5
AUG.				
20...	1425	19	2200	27.0
SEP.				
19...	1200	96	1590	12.0

06337000 - LITTLE MISSOURI RIVER NR WATFORD CITY, N. DAK. (LAT 47 35 25 LONG 103 15 05)

NOV., 1972				
01...	1410	61	1920	3.0
29...	1305	39	2610	.0
JAN., 1973				
16...	1415	12	2520	1.0
FEB.				
21...	1700	53	1660	1.0
MAR.				
08...	1330	1680	--	1.0
23...	1655	468	1400	3.0
APR.				
25...	1430	1430	1660	11.0
MAY				
13...	0600	311	--	12.0
24...	1400	150	1980	16.0
JUNE				
28...	1345	2020	1095	23.5
AUG.				
01...	1205	135	2400	27.0
29...	1250	24	2140	23.0
SEP.				
27...	1120	141	1300	15.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN.

KNIFE RIVER BASIN

06339100 - KNIFE RIVER AT MANNING, N. DAK. (LAT 47 14 10 LONG 102 46 10)

OCT., 1972				
05...	1335	2.4	--	9.0
NOV.				
09...	1510	2.3	2020	2.0
DEC.				
18...	1510	1.7	2385	.0
JAN., 1973				
23...	1610	5.2	1640	.0
FEB.				
08...	1510	2.0	1320	.0
MAR.				
02...	1630	925	--	1.0
08...	1525	106	260	.5
APR.				
09...	1430	5.6	1390	5.0
MAY				
01...	1215	7.4	1790	10.0
JUNE				
04...	1100	6.1	1960	15.0
JULY				
05...	1535	.93	2400	23.0
AUG.				
02...	1655	.13	2040	24.0
SEP.				
07...	1655	.06	2520	15.5

06339300 - KNIFE RIVER AT MARSHALL, N. DAK. (LAT 47 08 17 LONG 102 20 00)

OCT., 1972				
16...	1145	6.9	2200	6.0
NOV.				
22...	1455	6.4	2230	1.0
DEC.				
18...	1340	4.0	2960	.0
JAN., 1973				
23...	1430	30	1450	.0
FEB.				
21...	1415	10	1600	1.0
27...	1525	840	460	1.0
MAR.				
07...	1055	623	290	1.0
15...	1310	133	610	2.0
APR.				
20...	1220	26	2000	11.0
MAY				
24...	1605	8.7	2180	16.0
JUNE				
22...	1520	6.4	2200	24.0
JULY				
17...	1750	1.9	2350	25.0
AUG.				
22...	1610	1.3	2210	25.5
SEP.				
18...	1155	1.8	2200	12.5

06339490 - ELM CREEK NEAR GOLDEN VALLEY, N. DAK. (LAT 47 06 25 LONG 102 03 05)

OCT., 1972				
16...	1740	.06	2100	.5
NOV.				
21...	1100	.05	2180	1.0
JAN., 1973				
23...	1235	2.2	1120	.0
FEB.				
23...	1145	46	840	1.0
MAR.				
01...	1235	259	210	1.5
03...	1140	88	280	2.0
07...	1730	42	540	1.5
15...	1130	8.3	620	1.0
APR.				
18...	1200	.15	1600	10.5
MAY				
23...	1045	.02	2110	13.0
JUNE				
21...	1335	.67	2050	17.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 6. MISSOURI RIVER BASIN

## KNIFE RIVER BASIN

06339500 - KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK. (LAT 47 09 40 LONG 102 03 39)

OCT., 1972				
16...	1700	15	1900	6.0
NOV.				
21...	1215	13	2090	.0
DEC.				
19...	1250	9.1	2850	.0
JAN., 1973				
22...	1630	94	1460	.0
FEB.				
23...	1320	36	1100	1.0
MAR.				
01...	1405	1640	310	2.0
03...	1405	2130	300	1.5
07...	1635	946	310	--
15...	1310	218	680	1.0
APR.				
18...	1325	31	1700	12.0
MAY				
23...	1215	15	2120	15.5
JUNE				
21...	1535	15	2230	20.0
JULY				
17...	1320	3.3	3000	22.5
AUG.				
22...	1345	2.3	2140	23.5
SEP.				
17...	1345	4.6	2120	12.0

06340000 - SPRING CREEK AT ZAP, N. DAK. (LAT 47 17 10 LONG 101 55 31)

OCT., 1972				
16...	1325	34	1250	6.0
NOV.				
21...	1420	26	1190	.5
DEC.				
21...	1420	20	1480	.0
JAN., 1973				
22...	1455	19	1390	.0
FEB.				
23...	1500	31	970	1.0
MAR.				
01...	1540	1010	230	2.0
03...	1540	1120	180	1.5
07...	1225	123	370	1.5
15...	1420	52	700	1.0
APR.				
18...	1545	17	1350	11.5
MAY				
23...	1615	11	1580	14.5
JUNE				
21...	1740	14	1510	20.5
JULY				
17...	1425	4.2	1850	24.0
AUG.				
21...	1515	4.5	1700	21.5
SEP.				
17...	1520	5.1	1600	11.0

06340200 - WEST BRANCH OTTER CREEK NEAR BEULAH, N. DAK. (LAT 47 08 05 LONG 101 39 35)

OCT., 1972				
26...	1420	.02	1290	5.5
NOV.				
24...	1250	.02	1560	4.0
FEB., 1973				
21...	1400	.03	1240	.5
23...	1225	10	720	.0
MAR.				
13...	0920	4.0	1010	.0
20...	1435	1.0	950	2.5
APR.				
26...	1600	.81	2150	9.5
MAY				
16...	1155	.05	2000	15.5
JUNE				
26...	1200	.10	2150	20.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

KNIFE RIVER BASIN

06340500 - KNIFE RIVER AT HAZEN, N. DAK. (LAT 47 17 06 LONG 101 37 26)

OCT., 1972				
16...	1505	69	1450	6.5
NOV.				
21...	1540	54	1500	.5
DEC.				
21...	1200	33	1700	.0
JAN., 1973				
22...	1310	133	1150	.0
FEB.				
23...	1630	532	750	1.0
MAR.				
01...	1715	2390	320	2.0
03...	1720	3610	--	1.5
07...	1445	1520	300	1.5
15...	1605	428	650	1.0
APR.				
18...	1400	79	1400	11.5
MAY				
23...	1800	43	1720	15.5
JUNE				
22...	1050	53	1790	19.5
JULY				
17...	1540	20	2150	25.0
AUG.				
21...	1220	15	1530	21.5
SEP.				
18...	0850	17	1525	10.0

TURTLE CREEK BASIN

06341400 - TURTLE CREEK NEAR TURTLE LAKE, N. DAK. (LAT 47 27 30 LONG 100 55 15)

OCT., 1972				
27...	1400	1.7	3900	5.5
NOV.				
16...	1245	1.6	5300	.0
JAN., 1973				
09...	1430	.04	7000	.0
FEB.				
23...	1330	29	--	.0
MAR.				
02...	1430	26	1620	.0
08...	1125	6.0	2150	.5
13...	1305	11	2400	2.0
21...	1205	6.3	2200	4.0
APR.				
24...	1530	2.9	3800	11.5
MAY				
23...	1115	.03	4400	13.0
JUNE				
21...	1330	.16	3900	20.0

SQUARE BUTTE CREEK BASIN

06342100 - SQUARE BUTTE CREEK TRIBUTARY NO 2 NEAR CENTER, N. DAK. (LAT 47 06 40 LONG 101 15 05)

OCT., 1972				
26...	1115	.10	1240	5.0
NOV.				
24...	1030	.06	1260	2.0
FEB., 1973				
23...	1030	.81	480	.0
MAR.				
08...	1100	1.3	435	.0
21...	1045	1.3	340	2.0
APR.				
26...	1220	.47	1040	9.5
MAY				
15...	1600	.10	1050	18.5
JUNE				
26...	1035	.06	980	18.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 6. MISSOURI RIVER BASIN

## SQUARE BUTTE CREEK BASIN

06342260 - SQUARE BUTTE CREEK BELOW CENTER, N. DAK. (LAT 47 03 25 LONG 101 11 35)

OCT., 1972				
26...	0945	1.3	960	6.0
NOV.				
24...	1000	1.2	980	2.0
JAN., 1973				
11...	0910	1.7	950	.0
26...	1450	2.0	650	1.0
FEB.				
21...	0935	1.5	920	.0
MAR.				
01...	1110	370	530	6.5
08...	0945	5.8	720	4.5
21...	0940	5.9	700	5.5
APR.				
26...	1030	1.8	970	8.5
MAY				
15...	1355	1.4	940	16.5
JUNE				
27...	1015	1.4	950	20.5
JULY				
26...	1330	1.4	950	22.0
AUG.				
20...	1110	1.1	900	20.5
SEP.				
25...	1005	1.5	780	10.5

## BURNT CREEK BASIN

06342450 - BURNT CREEK NEAR BISMARCK, N. DAK. (LAT 46 54 54 LONG 100 48 48)

NOV., 1972				
16...	1550	.25	--	1.0
FEB., 1973				
23...	0945	10	50	.0
MAR.				
01...	1205	121	185	.0
08...	0910	4.8	340	.0
13...	1610	7.1	450	1.0
23...	1135	2.8	530	.5
APR.				
23...	1630	3.2	1030	11.5
MAY				
23...	1455	.20	1270	14.0
JUNE				
27...	1245	.04	1200	16.0

## MISSOURI RIVER MAIN STEM

06342500 - MISSOURI RIVER AT BISMARCK, N. DAK. (LAT 46 48 51 LONG 100 49 12)

OCT., 1972				
24...	1520	22600	670	8.5
NOV.				
06...	1500	26900	660	6.5
JAN., 1973				
02...	1040	25900	640	--
16...	1400	29500	610	.0
29...	1145	26700	755	--
MAR.				
07...	1650	28800	610	4.5
12...	1125	26100	630	2.5
26...	1135	23600	650	4.0
APR.				
09...	1130	24600	635	2.0
11...	0845	26500	635	3.5
MAY				
02...	1030	16800	635	6.0
JUNE				
05...	1115	17700	635	11.5
20...	1045	19900	600	12.5
JULY				
17...	1105	20700	630	16.5
AUG.				
02...	0830	20000	610	17.0
16...	1100	20000	615	16.5
29...	1110	23600	630	16.0
SEP.				
19...	0830	20800	630	14.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

HEART RIVER BASIN

06344600 - GREEN RIVER NEAR NEW HRADEC, N. DAK. (LAT 47 01 40 LONG 103 03 10)

OCT., 1972				
18...	1155	1.6	1160	3.0
NOV.				
24...	1415	1.7	1280	1.0
DEC.				
19...	1005	1.1	1260	.5
JAN., 1973				
19...	1135	3.0	940	.0
FEB.				
20...	1725	1.3	850	.0
MAR.				
02...	1705	981	150	2.0
05...	1515	170	220	2.0
12...	1100	56	400	2.0
APR.				
19...	1645	5.6	1200	12.0
MAY				
22...	1725	2.0	1300	15.5
JUNE				
20...	1435	12	1890	16.0
JULY				
19...	1520	.06	1610	24.5
AUG.				
23...	1235	.01	1500	21.5
SEP.				
18...	1525	.71	1300	14.0

06345000 - GREEN RIVER NEAR GLADSTONE, N. DAK. (LAT 46 53 40 LONG 102 37 25)

OCT., 1972				
18...	1135	8.4	1710	3.0
NOV.				
22...	1630	8.8	1510	.0
DEC.				
18...	1205	5.7	1890	.0
JAN., 1973				
18...	1540	52	--	.5
FEB.				
21...	1140	8.4	150	1.0
27...	1350	272	470	1.0
MAR.				
03...	1150	1500	175	1.0
08...	1425	164	410	1.5
15...	1145	78	600	2.0
APR.				
20...	1620	44	1700	11.0
MAY				
25...	1020	6.5	1700	14.0
JUNE				
29...	1515	5.5	1590	25.5
AUG.				
02...	1515	1.4	2100	27.0
30...	1520	.87	2190	22.0
SEP.				
18...	1335	2.7	2040	12.5

06345500 - HEART RIVER NEAR RICHARDTON, N. DAK. (LAT 46 44 46 LONG 102 18 27)

OCT., 1972				
02...	1335	28	2000	13.0
NOV.				
01...	1315	44	1950	1.0
DEC.				
01...	1350	25	1730	.0
JAN., 1973				
18...	1410	189	890	1.0
FEB.				
21...	1700	42	1600	1.0
MAR.				
03...	1620	3180	250	1.0
08...	1210	479	540	1.0
15...	1520	215	700	2.5
APR.				
20...	1420	151	1950	11.0
MAY				
24...	1400	24	1740	17.0
JUNE				
29...	1135	18	1700	22.5
AUG.				
02...	1210	7.6	2050	26.0
30...	1235	3.5	2200	23.0



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

HEART RIVER BASIN

06347000 - ANTELOPE CREEK NEAR CARSON, N. DAK. (LAT 46 31 50 LONG 101 38 25)

OCT., 1972				
24...	1310	5.0	990	4.5
NOV.				
22...	1015	6.7	1180	.5
JAN., 1973				
09...	1300	2.6	1475	.0
24...	0955	44	820	.0
26...	1240	65	640	.0
FEB.				
01...	1245	34	750	.0
08...	1200	3.6	750	.0
MAR.				
01...	1045	189	380	1.0
16...	1415	24	740	1.0
23...	1055	18	810	1.0
APR.				
23...	1500	23	1200	12.0
MAY				
25...	1410	4.1	1300	14.5
JUNE				
20...	1215	4.1	1260	16.0
JULY				
25...	1430	.56	1270	23.0
AUG.				
21...	1450	.03	950	24.0
SEP.				
26...	1320	1.6	710	14.5

06348000 - HEART RIVER NEAR LARK, N. DAK. (LAT 46 36 37 LONG 101 22 54)

OCT., 1972				
24...	1550	19	1250	6.5
NOV.				
22...	1215	51	118	1.0
JAN., 1973				
09...	1535	14	1300	1.0
24...	1545	150	--	.5
FEB.				
01...	1530	230	1000	.0
08...	1350	160	--	.0
21...	1330	79	1020	.0
MAR.				
05...	1225	3210	1100	1.0
15...	1030	800	660	1.0
21...	1305	380	620	5.0
APR.				
25...	1000	260	1060	9.0
MAY				
25...	1135	130	1140	16.0
JUNE				
20...	1500	120	2550	19.0
JULY				
24...	1000	150	1200	20.0
AUG.				
23...	1010	69	1300	21.0
SEP.				
27...	1240	16	1130	15.5

06348500 - SWEETBRIAR CREEK NEAR JUDSON, N. DAK. (LAT 46 51 06 LONG 101 15 10)

NOV., 1972				
22...	1400	.36	1250	2.5
JAN., 1973				
08...	1125	.25	1790	.0
26...	1445	1.	1040	.0
FEB.				
20...	1305	1.7	910	.5
MAR.				
01...	1550	260	425	2.0
08...	1540	22	245	3.5
21...	1455	5.3	395	6.5
APR.				
27...	1100	3.9	710	9.5
MAY				
21...	1445	.42	970	18.5
JUNE				
25...	1355	.22	1460	23.0
JULY				
23...	1300	.37	1740	20.0
AUG.				
22...	1000	.17	1700	22.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

HEART RIVER BASIN

06349000 - HEART RIVER NEAR MANDAN, N. DAK. (LAT 46 50 12 LONG 100 58 27)

OCT., 1972				
25...	1000	33	1320	3.0
NOV.				
20...	1015	56	1240	.5
JAN., 1973				
10...	1335	19	1625	.0
26...	1045	125	1520	1.5
FEB.				
01...	1510	130	830	.0
08...	1445	125	1170	.0
20...	1045	50	1130	.0
MAR.				
05...	1550	3470	970	1.0
09...	1430	2280	880	4.0
15...	1430	1080	700	2.5
30...	1030	275	750	5.5
APR.				
27...	1305	282	1100	12.0
MAY				
24...	1505	150	1140	18.0
JUNE				
25...	0845	94	1190	21.5
JULY				
23...	0845	101	1280	18.5
AUG.				
22...	1445	59	1350	25.5
SEP.				
18...	1245	78	1260	14.5

CANNONBALL RIVER BASIN

06350000 - CANNONBALL RIVER AT REGENT, N. DAK. (LAT 46 25 36 LONG 102 33 05)

OCT., 1972				
13...	1250	14	1600	9.0
NOV.				
16...	1110	14	2100	.0
DEC.				
15...	1335	6.4	2500	.5
JAN., 1973				
24...	1445	78	1695	.5
FEB.				
05...	1445	30	1395	.5
MAR.				
02...	1355	527	441	1.0
12...	1350	92	890	.5
APR.				
13...	1215	32	1910	11.0
MAY				
11...	1255	18	3020	12.0
JULY				
13...	1335	3.4	2750	22.5
AUG.				
09...	1550	3.7	2250	22.0
SEP.				
13...	1640	3.5	2060	16.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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## PART 6. MISSOURI RIVER BASIN

## CANNONBALL RIVER BASIN

06353000 - CEDAR CREEK NEAR RALEIGH, N. DAK. (LAT 46 05 00 LONG 101 20 00)

OCT., 1972				
24...	1045	22	2400	3.5
NOV.				
21...	1525	28	2140	.5
JAN., 1973				
09...	1045	4.2	3400	.0
24...	1240	411	1210	.5
26...	1045	537	750	.5
FEB.				
01...	1045	384	1080	.5
08...	1030	88	--	.0
21...	0950	22	1500	.0
MAR.				
01...	1450	342	630	.5
06...	1135	505	840	.0
16...	1200	231	890	1.5
23...	1430	262	890	4.0
APR.				
23...	1100	97	1660	10.0
MAY				
22...	1305	27	3180	17.0
JUNE				
20...	0945	52	1160	15.0
JULY				
25...	1100	14	1660	21.5
AUG.				
21...	1210	.80	3300	23.0
SEP.				
26...	1040	18	445	13.5

## JAMES RIVER BASIN

06467600 - JAMES RIVER NEAR MANFRED, N. DAK. (LAT 47 38 40 LONG 099 49 40)

NOV., 1972				
06...	1315	.02	1270	2.5
APR., 1973				
30...	1400	.06	950	12.0

06467900 - BIG SLOUGH AT HAMBERG, N. DAK. (LAT 47 45 20 LONG 099 30 42)

MAR., 1973				
23...	1100	.02	285	.5
APR.				
30...	1530	.05	1050	9.5

06468170 - JAMES RIVER NEAR GRACE CITY, N. DAK. (LAT 47 33 29 LONG 098 51 45)

OCT., 1972				
03...	1410	.22	1500	19.0
31...	1710	.35	1730	2.5
NOV.				
27...	1515	.33	1790	1.0
MAR., 1973				
08...	1740	2.1	1210	.0
13...	1405	3.0	995	.0
20...	1340	1.1	1260	1.0
APR.				
06...	1350	.79	450	6.0
MAY				
08...	1530	.09	1400	13.5
29...	1245	.09	1700	23.5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	TEMPER- ATURE (DEG C)
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PART 6. MISSOURI RIVER BASIN

JAMES RIVER BASIN

06469500 - PIPESTEM CREEK NEAR BUCHANAN, N. DAK. (LAT 47 03 59 LONG 098 55 07)

OCT., 1972				
31...	1305	1.1	1440	2.5
NOV.				
27...	1320	.68	1150	.5
FEB., 1973				
27...	0850	.31	900	.0
MAR.				
13...	0900	21	410	.0
23...	1325	11	515	.0
APR.				
09...	1455	4.7	800	4.5
MAY				
08...	1200	2.0	800	16.5
29...	0915	.87	1020	16.0
JUNE				
27...	1100	.43	1060	.4

06470000 - JAMES RIVER AT JAMESTOWN, N. DAK. (LAT 46 53 22 LONG 098 40 58)

OCT., 1972				
03...	0820	44	725	12.0
31...	0955	4.6	1200	4.0
NOV.				
27...	1125	4.5	1090	5.0
JAN., 1973				
15...	1500	3.6	1460	3.0
FEB.				
26...	1540	5.2	1020	.0
MAR.				
12...	1745	43	484	.0
APR.				
09...	1700	7.9	700	6.5
MAY				
08...	1230	7.3	1000	13.5
28...	1800	5.5	1080	22.0
JUNE				
27...	0850	4.5	1250	16.5
JULY				
23...	1600	12	1000	8.0
AUG.				
28...	1140	1.7	1020	24.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED CALCIUM (CA) (MG/L)	DIS- SOLVED MAGNESIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05051500 - RED RIVER OF THE NORTH AT WAHPETON, N. DAK. (LAT 46 15 55 LONG 096 35 40)

MAY, 1973										
02...	1430	392	4.9	40	70	51	33	19	6.1	270

05051600 - WILD RICE RIVER NEAR RUTLAND, N. DAK. (LAT 46 01 20 LONG 097 30 40)

MAY, 1973										
02...	1305	.02	5.0	0	40	160	150	170	25	350

05051700 - WILD RICE RIVER NEAR CAYUGA, N. DAK. (LAT 46 07 30 LONG 097 21 40)

MAY, 1973										
02...	1200	.47	18	0	160	160	76	110	17	328
JULY										
10...	1800	.10	18	60	360	65	38	50	13	218

05055520 - BIG COULEE NR FT. TOTTEN, N. DAK. (LAT 47 52 57 LONG 098 58 02)

MAY, 1973										
02...	1500	1.6	23	200	100	70	26	20	6.3	337
JULY										
25...	1100	.37	32	210	180	81	24	24	6.9	403

05056100 - MAUVAIS COULEE NEAR CANDO, N. DAK. (LAT 48 26 53 LONG 099 06 08)

MAY, 1973										
01...	1700	.23	6.6	60	160	130	67	71	17	363

05056200 - EDMORE COULEE NEAR EDMORE, N. DAK. (LAT 48 20 14 LONG 098 39 33)

MAY, 1973										
01...	1100	.17	15	180	80	76	34	62	19	293

05057200 - BALDHILL CREEK NEAR DAZEY, N. DAK. (LAT 47 13 45 LONG 098 07 28)

MAY, 1973										
02...	0915	5.8	13	20	160	88	49	62	7.7	376
JULY										
03...	1430	1.4	5.7	230	40	50	45	110	8.2	340

05058000 - SHEYENNE RIVER BELOW BALDHILL DAM, N. DAK. (LAT 47 01 50 LONG 098 05 50)

MAY, 1973										
01...	1700	9.3	9.3	0	80	48	29	67	8.8	299
JULY										
03...	1600	12	8.6	150	80	40	29	68	8.6	276

05058500 - SHEYENNE RIVER AT VALLEY CITY, N. DAK. (LAT 46 54 50 LONG 098 00 30)

MAY, 1973										
01...	1530	15	5.2	0	0	54	36	72	8.7	306
JULY										
10...	1200	8.8	9.1	410	220	47	32	74	9.1	314

05059000 - SHEYENNE RIVER NEAR KINDRED, N. DAK. (LAT 46 37 35 LONG 097 00 05)

MAY, 1973										
01...	1545	88	15	0	320	90	42	62	7.8	380
JULY										
11...	1530	37	23	20	0	89	26	72	8.1	356

05059500 - SHEYENNE RIVER AT WEST FARGO, N. DAK. (LAT 46 53 28 LONG 096 54 24)

MAY, 1973										
01...	1220	92	15	40	210	89	42	69	7.9	378
JULY										
13...	1100	38	22	40	20	86	30	79	8.2	350

05060000 - MAPLE RIVER NEAR MAPLETON, N. DAK. (LAT 46 51 40 LONG 097 06 10)

MAY, 1973										
01...	1030	30	9.3	40	10	140	77	120	11	369
JULY										
13...	1300	.99	20	40	700	110	64	130	13	296

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (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)
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PART 5. HUDSON BAY BASIN  
RED RIVER OF THE NORTH BASIN

05051500 - RED RIVER OF THE NORTH AT WAMPETON, N. DAK. (LAT 46 15 55 LONG 096 35 40)										
MAY , 1973 02...	0	221	73	10	.1	.23	.05	344	.47	364
05051600 - WILD RICE RIVER NEAR RUTLAND, N. DAK. (LAT 46 01 20 LONG 097 30 40)										
MAY , 1973 02...	0	287	950	78	.2	.23	.07	1770	2.41	.10
05051700 - WILD RICE RIVER NEAR CAYUGA, N. DAK. (LAT 46 07 30 LONG 097 21 40)										
MAY , 1973 02...	0	269	590	54	.5	.23	.13	1220	1.66	1.55
JULY 10...	0	179	230	20	.4	.47	.59	567	.77	.15
05055520 - BIG COULEE NR FT. TOTTEN, N. DAK. (LAT 47 52 57 LONG 098 58 02)										
MAY , 1973 02...	0	276	38	7.6	.2	.23	.01	359	.49	1.55
JULY 25...	0	331	15	9.5	.4	.23	.06	427	.58	.43
05056100 - MAUVAIS COULEE NEAR CANDO, N. DAK. (LAT 48 26 53 LONG 099 06 08)										
MAY , 1973 01...	0	298	400	42	.1	.23	.11	976	1.33	.61
05056200 - EDMORE COULEE NEAR EDMORE, N. DAK. (LAT 48 20 14 LONG 098 39 33)										
MAY , 1973 01...	0	240	200	24	.1	.23	.18	634	.86	.29
05057200 - BALDHILL CREEK NEAR DAZEY, N. DAK. (LAT 47 13 45 LONG 098 07 28)										
MAY , 1973 02...	0	308	210	20	.1	.23	.06	649	.88	10.2
JULY 03...	0	279	220	30	.1	.36	.06	675	.92	2.55
05058000 - SHEYENNE RIVER BELOW BALDHILL DAM, N. DAK. (LAT 47 01 50 LONG 098 05 50)										
MAY , 1973 01...	0	245	130	15	.1	.56	.13	455	.62	11.4
JULY 03...	4	233	130	13	.1	.56	.17	450	.61	14.6
05058500 - SHEYENNE RIVER AT VALLEY CITY, N. DAK. (LAT 46 54 50 LONG 098 00 30)										
MAY , 1973 01...	0	251	150	21	.2	.23	.12	502	.68	20.3
JULY 10...	0	258	130	18	.3	.56	.39	521	.71	12.4
05059000 - SHEYENNE RIVER NEAR KINDRED, N. DAK. (LAT 46 37 35 LONG 097 00 05)										
MAY , 1973 01...	0	312	160	29	.2	.23	.09	613	.83	146
JULY 11...	0	292	160	40	.3	.56	.16	624	.85	62.3
05059500 - SHEYENNE RIVER AT WEST FARGO, N. DAK. (LAT 46 53 28 LONG 096 54 24)										
MAY , 1973 01...	0	310	170	33	.2	.23	.13	596	.81	148
JULY 13...	0	287	170	49	.2	.56	.19	648	.88	66.5
05060000 - MAPLE RIVER NEAR MAPLETON, N. DAK. (LAT 46 51 40 LONG 097 06 10)										
MAY , 1973 01...	0	303	480	84	.2	.23	.08	1130	1.54	91.5
JULY 13...	0	243	460	99	.2	.56	.20	1110	1.51	2.97



## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO2) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05051500 - RED RIVER OF THE NORTH AT WAHPETON, N. DAK. (LAT 46 15 55 LONG 096 35 40)

MAY , 1973 02...	260	42	13	.5	563	8.1	11.0	3.4	130
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05051600 - WILD RICE RIVER NEAR RUTLAND, N. DAK. (LAT 46 01 20 LONG 097 30 40)

MAY , 1973 02...	1000	730	26	2.3	2230	7.9	15.0	7.1	90
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05051700 - WILD RICE RIVER NEAR CAYUGA, N. DAK. (LAT 46 07 30 LONG 097 21 40)

MAY , 1973 02...	710	440	25	1.8	1570	8.0	9.0	5.2	280
JULY 10...	320	140	25	1.2	828	7.6	29.0	8.8	40

05055520 - BIG COULEE NR FT. TOTTEN, N. DAK. (LAT 47 52 57 LONG 098 58 02)

MAY , 1973 02...	280	5	13	.5	562	8.2	10.5	3.4	30
JULY 25...	300	0	14	.6	638	7.8	16.0	10	40

05056100 - MAUVAIS COULEE NEAR CAMDO, N. DAK. (LAT 48 26 53 LONG 099 06 08)

MAY , 1973 01...	600	300	20	1.3	1350	7.9	12.5	7.3	0
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05056200 - EDMORE COULEE NEAR EDMORE, N. DAK. (LAT 48 20 14 LONG 098 39 33)

MAY , 1973 01...	330	89	28	1.5	896	7.9	6.0	5.9	60
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05057200 - BALDHILL CREEK NEAR DAZEY, N. DAK. (LAT 47 13 45 LONG 098 07 28)

MAY , 1973 02...	420	110	24	1.3	954	8.1	6.5	4.8	130
JULY 03...	310	31	43	2.7	1010	8.2	22.5	3.4	220

05058000 - SHEYENNE RIVER BELOW BALDHILL DAM, N. DAK. (LAT 47 01 50 LONG 098 05 50)

MAY , 1973 01...	240	0	37	1.9	724	8.0	10.0	4.8	130
JULY 03...	220	0	39	2.0	704	8.3	24.5	2.3	220

05058500 - SHEYENNE RIVER AT VALLEY CITY, N. DAK. (LAT 46 54 50 LONG 098 00 30)

MAY , 1973 01...	280	32	35	1.9	807	8.1	10.5	3.9	90
JULY 10...	250	0	38	2.0	755	7.9	25.5	6.3	90

05059000 - SHEYENNE RIVER NEAR KINDRED, N. DAK. (LAT 46 37 35 LONG 097 00 05)

MAY , 1973 01...	400	86	25	1.4	929	8.0	9.0	6.1	130
JULY 11...	330	37	32	1.7	928	8.0	27.0	5.7	860

05059500 - SHEYENNE RIVER AT WEST FARGO, N. DAK. (LAT 46 53 28 LONG 096 54 24)

MAY , 1973 01...	400	85	27	1.5	960	8.0	9.5	6.0	90
JULY 13...	340	51	33	1.9	977	7.9	23.0	7.1	170

05060000 - MAPLE RIVER NEAR MAPLETON, N. DAK. (LAT 46 51 40 LONG 097 06 10)

MAY , 1973 01...	670	360	28	2.0	1560	8.0	7.5	5.9	30
JULY 13...	540	300	34	2.4	1550	7.7	22.5	9.5	1000

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
PART 5. HUDSON BAY BASIN										
RED RIVER OF THE NORTH BASIN										
05060500 - RUSH RIVER AT AMENIA, N. DAK. (LAT 47 01 00 LONG 097 12 50)										
MAY, 1973										
01...	1300	2.0	4.8	0	100	140	62	120	14	419
05064500 - RED RIVER OF THE NORTH AT HALSTAD, MINN. (LAT 47 21 10 LONG 096 50 50)										
APR., 1973										
30...	1325	993	6.8	40	30	63	40	26	6.5	297
JULY										
09...	1530	404	13	150	10	49	31	21	6.5	275
05065500 - GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20 LONG 097 27 20)										
MAY, 1973										
02...	1600	2.4	9.3	20	110	120	63	44	9.2	298
JULY										
09...	1100	.20	15	190	890	96	46	54	9.6	287
05066500 - GOOSE RIVER AT HILLSBORO, N. DAK. (LAT 47 24 20 LONG 097 03 40)										
APR., 1973										
30...	1425	23	10	60	140	130	62	82	9.3	327
JULY										
09...	1300	2.8	20	300	1000	140	71	150	12	380
05084000 - FOREST RIVER NEAR FORDVILLE, N. DAK. (LAT 48 11 50 LONG 097 43 49)										
MAY, 1973										
07...	1445	12	13	0	150	74	34	21	6.5	285
05085000 - FOREST RIVER AT MINTO, N. DAK. (LAT 48 16 10 LONG 097 22 10)										
OCT., 1972										
13...	1630	6.2	16	0	280	72	35	34	6.5	281
MAY, 1973										
08...	1115	15	7.6	40	70	77	30	27	6.9	281
05089000 - SOUTH BRANCH PARK RIVER BELOW HOMME DAM, N. DAK. (LAT 48 24 07 LONG 097 46 55)										
MAY, 1973										
08...	1425	2.0	8.0	80	280	55	21	27	7.4	174
05089100 - MIDDLE BRANCH PARK RIVER NEAR UNION, N. DAK. (LAT 48 32 32 LONG 098 01 10)										
MAY, 1973										
08...	1535	.05	15	0	170	58	21	52	6.8	271
05089500 - CART CREEK AT MOUNTAIN, N. DAK. (LAT 48 40 37 LONG 097 51 41)										
MAY, 1973										
08...	1710	.43	17	60	40	110	29	49	7.9	280
05090000 - PARK RIVER AT GRAFTON, N. DAK. (LAT 48 25 24 LONG 097 24 30)										
MAY, 1973										
08...	1200	3.5	5.9	60	0	73	33	77	7.6	236
05092000 - RED RIVER OF THE NORTH AT DRAYTON, N. DAK. (LAT 48 34 20 LONG 097 08 50)										
MAY, 1973										
09...	1120	1400	2.4	20	20	68	33	41	7.3	284
05098700 - HIDDEN ISLAND COULEE NEAR HANSBORN, N. DAK. (LAT 48 57 10 LONG 099 25 35)										
MAY, 1973										
01...	1500	.01	9.3	180	80	130	75	54	15	344
05100000 - PEMBINA RIVER AT NECHE, N. DAK. (LAT 48 59 20 LONG 097 33 05)										
MAY, 1973										
09...	1320	72	16	20	80	73	35	48	8.5	297
05100500 - HERZOG CREEK NEAR CONCRETE, N. DAK. (LAT 48 45 13 LONG 097 54 22)										
MAY, 1973										
08...	1730	.02	13	60	800	94	23	35	6.6	313

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05060500 - RUSH RIVER AT AMENIA, N. DAK. (LAT 47 01 00 LONG 097 12 50)

MAY , 1973 01...	0	344	460	62	.2	.23	.08	1110	1.51	6.00
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## 05064500 - RED RIVER OF THE NORTH AT HALSTAD, MINN. (LAT 47 21 10 LONG 096 50 50)

APR., 1973 30...	0	244	110	15	.1	.56	.23	408	.55	1090
JULY 09...	0	226	65	11	.2	.45	.28	358	.49	391

## 05065500 - GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20 LONG 097 27 20)

MAY , 1973 02...	0	244	370	21	.1	.23	.02	809	1.10	5.24
JULY 09...	0	235	300	17	.2	.23	.08	718	.98	.39

## 05066500 - GOOSE RIVER AT HILLSBORO, N. DAK. (LAT 47 24 20 LONG 097 03 40)

APR., 1973 30...	0	268	380	58	.2	.23	.08	874	1.19	54.3
JULY 09...	0	312	540	100	.4	1.0	.91	1270	1.73	9.60

## 05084000 - FOREST RIVER NEAR FORDVILLE, N. DAK. (LAT 48 11 50 LONG 097 43 49)

MAY , 1973 07...	0	234	110	9.7	.2	.23	.03	397	.54	12.9
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## 05085000 - FOREST RIVER AT MINTO, N. DAK. (LAT 48 16 10 LONG 097 22 10)

OCT., 1972 13...	0	231	110	34	.2	.23	.05	455	.62	7.62
MAY , 1973 08...	0	230	120	18	.2	.23	.03	446	.61	18.1

## 05089000 - SOUTH BRANCH PARK RIVER BELOW HOMME DAM, N. DAK. (LAT 48 24 07 LONG 097 46 55)

MAY , 1973 08...	0	143	120	11	.1	.23	.04	346	.47	1.87
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## 05089100 - MIDDLE BRANCH PARK RIVER NEAR UNION, N. DAK. (LAT 48 32 32 LONG 098 01 10)

MAY , 1973 08...	0	222	96	18	.2	.23	.10	394	.54	.05
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## 05089500 - CART CREEK AT MOUNTAIN, N. DAK. (LAT 48 40 37 LONG 097 51 41)

MAY , 1973 08...	0	230	240	27	.5	.23	.12	633	.86	.73
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## 05090000 - PARK RIVER AT GRAFTON, N. DAK. (LAT 48 25 24 LONG 097 24 30)

MAY , 1973 08...	0	194	190	70	.2	.45	.04	564	.77	5.33
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## 05092000 - RED RIVER OF THE NORTH AT DRAYTON, N. DAK. (LAT 48 34 20 LONG 097 08 50)

MAY , 1973 09...	0	233	100	43	.2	.56	.13	452	.61	1710
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## 05098700 - HIDDEN ISLAND COULEE NEAR HANSBORO, N. DAK. (LAT 48 57 10 LONG 099 25 35)

MAY , 1973 01...	0	282	430	19	.1	.56	.12	991	1.35	.03
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## 05100000 - PEMBINA RIVER AT NECHE, N. DAK. (LAT 48 59 20 LONG 097 33 05)

MAY , 1973 09...	0	244	160	16	.2	.23	.11	524	.71	102
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## 05100500 - HERZOG CREEK NEAR CONCRETE, N. DAK. (LAT 48 45 13 LONG 097 54 22)

MAY , 1973 08...	0	257	120	18	.4	.23	.09	478	.65	.03
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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO2) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

05060500 - RUSH RIVER AT AMENIA, N. DAK. (LAT 47 01 00 LONG 097 12 50)

MAY, 1973 01...	610	260	30	2.1	1550	8.2	9.5	4.2	90
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05064500 - RED RIVER OF THE NORTH AT HALSTAD, MINN. (LAT 47 21 10 LONG 096 50 50)

APR., 1973 30...	320	78	15	.6	665	8.0	10.5	4.8	0
JULY 09...	250	24	15	.6	555	8.0	28.0	4.4	130

05065500 - GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20 LONG 097 27 20)

MAY, 1973 02...	560	320	14	.8	1100	7.9	11.0	6.0	60
JULY 09...	430	190	21	1.1	1010	7.8	23.5	7.3	40

05066500 - GOOSE RIVER AT HILLSBORO, N. DAK. (LAT 47 24 20 LONG 097 03 40)

APR., 1973 30...	580	310	23	1.5	1310	7.9	10.5	6.6	130
JULY 09...	640	330	33	2.6	1750	7.7	25.0	12	390

05084000 - FOREST RIVER NEAR FORDVILLE, N. DAK. (LAT 48 11 50 LONG 097 43 49)

MAY, 1973 07...	330	91	12	.5	677	8.1	14.0	3.6	90
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05085000 - FOREST RIVER AT MINTO, N. DAK. (LAT 48 16 10 LONG 097 22 10)

OCT., 1972 13...	320	93	18	.8	731	7.8	9.0	7.1	170
MAY, 1973 08...	320	89	15	.7	723	8.2	12.5	2.8	0

05089000 - SOUTH BRANCH PARK RIVER BELOW HOMME DAM, N. DAK. (LAT 48 24 07 LONG 097 46 55)

MAY, 1973 08...	220	81	20	.8	557	7.9	16.0	3.5	0
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05089100 - MIDDLE BRANCH PARK RIVER NEAR UNION, N. DAK. (LAT 48 32 32 LONG 098 01 10)

MAY, 1973 08...	230	9	32	1.5	635	8.1	19.0	3.4	0
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05089500 - CART CREEK AT MOUNTAIN, N. DAK. (LAT 48 40 37 LONG 097 51 41)

MAY, 1973 08...	390	170	21	1.1	946	8.2	18.0	2.8	0
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05090000 - PARK RIVER AT GRAFTON, N. DAK. (LAT 48 25 24 LONG 097 24 30)

MAY, 1973 08...	320	130	34	1.9	921	8.1	12.0	3.0	90
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05092000 - RED RIVER OF THE NORTH AT DRAYTON, N. DAK. (LAT 48 34 20 LONG 097 08 50)

MAY, 1973 09...	310	73	22	1.0	766	8.1	14.5	3.6	90
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05098700 - HIDDEN ISLAND COULEE NEAR HANSBORO, N. DAK. (LAT 48 57 10 LONG 099 25 35)

MAY, 1973 01...	630	350	15	.9	1290	7.7	12.0	11	0
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05100000 - PEMBINA RIVER AT NECHE, N. DAK. (LAT 48 59 20 LONG 097 33 05)

MAY, 1973 09...	330	83	24	1.2	810	8.1	15.0	3.8	60
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05100500 - HERZOG CREEK NEAR CONCRETE, N. DAK. (LAT 48 45 13 LONG 097 54 22)

MAY, 1973 08...	330	73	18	.8	764	8.2	20.0	3.2	130
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## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05101000 - TONGUE RIVER AT AKRA, N. DAK. (LAT 48 46 40 LONG 097 42 55)

MAY , 1973										
09...	1630	5.2	13	0	30	66	15	21	6.7	230

## 05113600 - LONG CREEK NEAR NOONAN, N. DAK. (LAT 48 58 52 LONG 103 04 34)

MAY , 1973										
01...	1015	10	1.5	810	60	94	81	200	14	387
JULY										
03...	1630	.19	13	2200	200	100	88	250	11	430

## 05114000 - SOURIS RIVER NEAR SHERWOOD, N. DAK. (LAT 48 59 24 LONG 101 57 28)

MAY , 1973										
08...	1200	27	1.2	120	160	59	45	130	8.7	312
JULY										
03...	1215	10	11	40	30	72	56	170	9.4	431

## 05116500 - DES LACS RIVER AT FOXHOLM, N. DAK. (LAT 48 22 14 LONG 101 34 11)

MAY , 1973										
11...	1130	13	2.5	100	100	97	78	230	9.8	509
JULY										
05...	1015	7.9	13	380	20	100	71	180	8.2	495

## 05117500 - SOURIS RIVER ABOVE MINOT, N. DAK. (LAT 48 14 45 LONG 101 22 15)

MAY , 1973										
11...	1000	20	4.3	80	410	90	74	210	11	436
JULY										
05...	0800	7.9	15	300	470	76	46	87	11	291

## 05120500 - WINTERING RIVER NEAR KARLSRUHE, N. DAK. (LAT 48 10 14 LONG 100 32 20)

MAY , 1973										
11...	1340	8.3	10	100	90	60	33	96	6.5	433
JULY										
05...	1400	4.1	19	420	20	51	25	69	6.3	373

## 05122000 - SOURIS RIVER NEAR BANTRY, N. DAK. (LAT 48 30 20 LONG 100 26 04)

MAY , 1973										
10...	1500	353	8.4	100	40	63	42	100	9.0	371
JULY										
04...	1945	94	13	230	10	61	38	81	9.1	249

## 05123400 - WILLOW CREEK NEAR WILLOW CITY, N. DAK. (LAT 48 35 20 LONG 100 26 30)

MAY , 1973										
09...	1730	11	3.0	100	80	74	79	120	14	433
JULY										
04...	1745	11	12	260	0	77	89	240	13	402

## 05123510 - DEEP RIVER NEAR UPHAM, N. DAK. (LAT 48 35 03 LONG 100 51 44)

MAY , 1973										
04...	1040	.74	7.3	40	90	61	56	39	15	350
JULY										
04...	1145	.18	4.0	230	0	33	55	47	15	232

## 05123900 - BOUNDARY CREEK NEAR LANDA, N. DAK. (LAT 48 48 46 LONG 100 51 46)

MAY , 1973										
09...	1145	.20	6.2	20	30	99	67	99	13	254
JULY										
04...	1315	1.1	2.6	190	20	65	53	130	11	229

## PART 6. MISSOURI RIVER BASIN

## YELLOWSTONE RIVER BASIN

## 06329597 - CHARBONNEAU CREEK NEAR CHARBONNEAU, N. DAK. (LAT 47 51 10 LONG 103 47 40)

MAY , 1973										
01...	1520	2.2	3.0	0	10	42	36	500	10	680
JULY										
05...	0935	.69	9.8	2100	10	41	24	290	8.7	426

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
PART 5. HUDSON BAY BASIN										
RED RIVER OF THE NORTH BASIN										
05101000 - TONGUE RIVER AT AKRA, N. DAK. (LAT 48 46 40 LONG 097 42 55)										
MAY , 1973 09...	0	189	72	9.0	.2	.56	.06	311	.42	4.37
05113600 - LONG CREEK NEAR NOONAN, N. DAK. (LAT 48 58 52 LONG 103 04 34)										
MAY , 1973 01...	0	317	610	25	.1	.45	.01	1290	1.76	34.8
JULY 03...	0	353	780	29	.2	.56	.18	1530	2.08	.79
05114000 - SOURIS RIVER NEAR SHERWOOD, N. DAK. (LAT 48 59 24 LONG 101 57 28)										
MAY , 1973 08...	0	256	310	33	.1	.23	.06	735	1.00	53.6
JULY 03...	0	354	370	47	.1	.56	.36	973	1.32	26.3
05116500 - DES LACS RIVER AT FOXHOLM, N. DAK. (LAT 48 22 14 LONG 101 34 11)										
MAY , 1973 11...	0	418	550	33	.2	.23	.11	1290	1.76	45.3
JULY 05...	0	406	510	22	.4	.56	.16	1170	1.59	25.0
05117500 - SOURIS RIVER ABOVE MINOT, N. DAK. (LAT 48 14 45 LONG 101 22 15)										
MAY , 1973 11...	0	358	570	33	.2	.23	.11	1200	1.63	64.8
JULY 05...	0	239	320	18	.2	.47	.15	738	1.00	15.7
05120500 - WINTERING RIVER NEAR KARLSRUHE, N. DAK. (LAT 48 10 14 LONG 100 32 20)										
MAY , 1973 11...	0	355	100	17	.1	.23	.05	562	.76	12.6
JULY 05...	0	306	61	9.7	.1	.23	.13	429	.58	4.75
05122000 - SOURIS RIVER NEAR BANTRY, N. DAK. (LAT 48 30 20 LONG 100 26 04)										
MAY , 1973 10...	0	304	220	20	.1	.23	.10	648	.88	618
JULY 04...	0	204	260	12	.1	.72	.24	665	.90	169
05123400 - WILLOW CREEK NEAR WILLOW CITY, N. DAK. (LAT 48 35 20 LONG 100 26 30)										
MAY , 1973 09...	8	369	360	31	.1	.23	.06	928	1.26	27.6
JULY 04...	38	393	640	57	.1	.23	.20	1430	1.95	42.5
05123510 - DEEP RIVER NEAR UPHAM, N. DAK. (LAT 48 35 03 LONG 100 51 44)										
MAY , 1973 04...	0	287	130	37	.1	.23	.04	545	.74	1.09
JULY 04...	31	242	130	41	.1	.23	.07	494	.67	.24
05123900 - BOUNDARY CREEK NEAR LANDA, N. DAK. (LAT 48 48 46 LONG 100 51 46)										
MAY , 1973 09...	0	208	490	20	.1	.23	.02	946	1.29	.51
JULY 04...	9	203	460	14	.1	.23	.11	906	1.23	2.69

## PART 6. MISSOURI RIVER BASIN

## YELLOWSTONE RIVER BASIN

06329597 - CHARBONNEAU CREEK NEAR CHARBONNEAU, N. DAK. (LAT 47 51 10 LONG 103 47 40)

MAY , 1973 01...	0	558	720	7.1	.4	.23	.02	1690	2.30	10.0
JULY 05...	4	356	480	3.8	.4	.23	.02	1120	1.52	2.09



## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO2) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 5. HUDSON BAY BASIN

## RED RIVER OF THE NORTH BASIN

## 05101000 - TONGUE RIVER AT AKRA, N. DAK. (LAT 48 46 40 LONG 097 42 55)

MAY , 1973 09...	230	38	16	.6	531	8.0	11.5	3.7	30
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## 05113600 - LONG CREEK NEAR NOONAN, N. DAK. (LAT 48 58 52 LONG 103 04 34)

MAY , 1973 01...	570	250	43	3.7	1780	7.9	8.0	7.8	470
JULY 03...	610	260	47	4.4	2040	8.1	24.0	5.5	0

## 05114000 - SOURIS RIVER NEAR SHERWOOD, N. DAK. (LAT 48 59 24 LONG 101 57 28)

MAY , 1973 08...	330	77	45	3.1	1130	8.0	12.0	5.0	160
JULY 03...	410	57	47	3.7	1380	8.0	18.5	6.9	160

## 05116500 - DES LACS RIVER AT FOXHOLM, N. DAK. (LAT 48 22 14 LONG 101 34 11)

MAY , 1973 11...	560	150	47	4.2	1820	8.2	9.5	5.1	350
JULY 05...	540	140	42	3.4	1610	7.9	21.0	10	40

## 05117500 - SOURIS RIVER ABOVE MINOT, N. DAK. (LAT 48 14 45 LONG 101 22 15)

MAY , 1973 11...	530	170	46	4.0	1710	8.0	12.0	7.0	30
JULY 05...	380	140	33	1.9	1060	7.6	20.5	12	90

## 05120500 - WINTERING RIVER NEAR KARLSRUHE, N. DAK. (LAT 48 10 14 LONG 100 32 20)

MAY , 1973 11...	290	0	42	2.5	859	8.1	9.5	5.5	160
JULY 05...	230	0	39	2.0	689	8.0	22.5	6.0	250

## 05122000 - SOURIS RIVER NEAR BANTRY, N. DAK. (LAT 48 30 20 LONG 100 26 04)

MAY , 1973 10...	330	26	39	2.4	972	7.9	13.5	7.5	220
JULY 04...	310	100	35	2.0	933	7.7	23.5	8.0	130

## 05123400 - WILLOW CREEK NEAR WILLOW CITY, N. DAK. (LAT 48 35 20 LONG 100 26 30)

MAY , 1973 09...	510	140	33	2.3	1330	8.3	14.0	3.6	0
JULY 04...	560	170	48	4.4	1920	8.8	23.5	1.2	310

## 05123510 - DEEP RIVER NEAR UPHAM, N. DAK. (LAT 48 35 03 LONG 100 51 44)

MAY , 1973 04...	380	96	17	.9	827	8.2	9.5	3.5	0
JULY 04...	310	67	24	1.2	772	9.0	22.5	.5	90

## 05123900 - BOUNDARY CREEK NEAR LANDA, N. DAK. (LAT 48 48 46 LONG 100 51 46)

MAY , 1973 09...	520	320	29	1.9	1290	7.9	11.5	5.1	130
JULY 04...	380	180	42	2.9	1260	8.5	22.0	1.3	90

## PART 6. MISSOURI RIVER BASIN

## YELLOWSTONE RIVER BASIN

## 06329597 - CHARBONNEAU CREEK NEAR CHARBONNEAU, N. DAK. (LAT 47 51 10 LONG 103 47 40)

MAY , 1973 01...	250	0	80	14	2440	8.1	12.0	8.6	40
JULY 05...	200	0	75	8.9	1610	8.3	23.0	3.5	170

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)
PART 6. MISSOURI RIVER BASIN										
WHITE EARTH RIVER BASIN										
06332000 - WHITE EARTH RIVER AT WHITE EARTH, N. DAK. (LAT 48 22 35 LONG 102 46 00)										
APR., 1973										
30...	1600	27	4.2	1200	40	46	50	260	14	566
JULY										
02...	1640	2.9	6.7	1100	60	49	55	360	8.2	719
SHELL CREEK BASIN										
06332520 - SHELL CREEK NEAR PARSHALL, N. DAK. (LAT 48 03 11 LONG 102 08 10)										
APR., 1973										
30...	1335	13	5.9	2000	80	38	50	520	11	781
JULY										
02...	1425	10	18	2200	50	41	50	500	9.0	816
LITTLE MISSOURI RIVER BASIN										
06335000 - LITTLE BEAVER CREEK NEAR MARMARTH, N. DAK. (LAT 46 16 29 LONG 103 58 33)										
APR., 1973										
11...	0935	14	5.0	280	80	60	45	270	5.1	494
JULY										
10...	1030	14	12	0	20	45	38	240	6.5	442
06335500 - LITTLE MISSOURI RIVER AT MARMARTH, N. DAK. (LAT 46 17 44 LONG 103 55 06)										
NOV., 1972										
14...	1330	35	7.4	3200	10	61	45	360	6.4	535
APR., 1973										
11...	1145	71	4.8	5700	20	72	39	310	6.8	414
MAY										
09...	1255	160	8.5	20	10	76	38	190	7.2	249
JULY										
10...	1210	95	11	60	10	67	35	210	8.8	305
06336000 - LITTLE MISSOURI RIVER AT MEDORA, N. DAK. (LAT 46 55 10 LONG 103 31 40)										
APR., 1973										
19...	1320	104	5.2	20	60	80	60	360	11	413
JUNE										
21...	1400	2420	9.8	0	40	49	31	250	7.8	130
KNIFE RIVER BASIN										
06339100 - KNIFE RIVER AT MANNING, N. DAK. (LAT 47 14 10 LONG 102 46 10)										
APR., 1973										
09...	1430	5.6	4.2	1100	80	47	30	250	6.3	458
JULY										
05...	1535	.93	6.5	1700	20	62	35	500	7.5	650
06339300 - KNIFE RIVER AT MARSHALL, N. DAK. (LAT 47 08 17 LONG 102 20 00)										
APR., 1973										
20...	1220	26	3.7	140	40	68	51	360	9.6	570
JUNE										
22...	1520	6.4	6.6	380	0	63	52	460	7.8	653
06339490 - ELM CREEK NEAR GOLDEN VALLEY, N. DAK. (LAT 47 06 25 LONG 102 03 05)										
APR., 1973										
18...	1200	.15	1.5	360	20	51	38	300	12	498
JUNE										
21...	1335	.67	2.6	230	160	69	61	410	11	561
06339500 - KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK. (LAT 47 09 40 LONG 102 03 39)										
OCT., 1972										
16...	1700	15	8.7	1100	120	55	52	370	7.9	652
APR., 1973										
18...	1325	31	3.6	60	20	65	47	310	11	535
JUNE										
21...	1535	15	7.0	110	60	68	67	450	9.1	592

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CaCO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (TONS AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)
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## PART 6. MISSOURI RIVER BASIN

## WHITE EARTH RIVER BASIN

## 06332000 - WHITE EARTH RIVER AT WHITE EARTH, N. DAK. (LAT 48 22 35 LONG 102 46 00)

APR., 1973										
30...	7	476	320	40	.2	.23	.10	1040	1.42	75.9
JULY										
02...	14	613	450	69	.3	.23	.30	1450	1.97	11.4

## SHELL CREEK BASIN

## 06332520 - SHELL CREEK NEAR PARSHALL, N. DAK. (LAT 48 03 11 LONG 102 08 10)

APR., 1973										
30...	15	666	710	11	.3	.23	.04	1830	2.49	64.3
JULY										
02...	8	683	680	7.7	.4	.23	.13	1770	2.41	47.8

## LITTLE MISSOURI RIVER BASIN

## 06335000 - LITTLE BEAVER CREEK NEAR MARMARTH, N. DAK. (LAT 46 16 29 LONG 103 58 33)

APR., 1973										
11...	0	405	500	9.4	.3	.23	.01	1150	1.56	43.5
JULY										
10...	7	374	400	5.7	.3	.23	.04	977	1.33	36.9

## 06335500 - LITTLE MISSOURI RIVER AT MARMARTH, N. DAK. (LAT 46 17 44 LONG 103 55 06)

NOV., 1972										
14...	0	439	650	30	.5	.23	--	1350	1.84	128
APR., 1973										
11...	0	340	670	19	.2	.23	.00	1330	1.81	255
MAY										
09...	0	204	530	8.5	.4	--	--	1040	1.41	449
JULY										
10...	5	259	490	7.5	.4	.23	.05	998	1.36	256

## 06336000 - LITTLE MISSOURI RIVER AT MEDORA, N. DAK. (LAT 46 55 10 LONG 103 31 40)

APR., 1973										
19...	5	347	870	15	.3	.23	.02	1680	2.29	472
JUNE										
21...	0	107	660	17	.4	.56	.06	1090	1.48	7130

## KNIFE RIVER BASIN

## 06339100 - KNIFE RIVER AT MANNING, N. DAK. (LAT 47 14 10 LONG 102 46 10)

APR., 1973										
09...	0	376	420	5.2	.2	.23	.01	1010	1.37	15.3
JULY										
05...	0	533	830	4.0	.6	.56	.06	1770	2.41	4.44

## 06339300 - KNIFE RIVER AT MARSHALL, N. DAK. (LAT 47 08 17 LONG 102 20 00)

APR., 1973										
20...	0	468	660	6.3	.5	.45	.02	1590	2.16	112
JUNE										
22...	0	536	810	4.4	.5	.23	.05	1720	2.34	29.7

## 06339490 - ELM CREEK NEAR GOLDEN VALLEY, N. DAK. (LAT 47 06 25 LONG 102 03 05)

APR., 1973										
18...	0	408	530	8.2	.1	.56	.05	1160	1.58	.47
JUNE										
21...	0	460	830	5.8	.3	.56	.08	1660	2.26	3.00

## 06339500 - KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK. (LAT 47 09 40 LONG 102 03 39)

OCT., 1972										
16...	0	535	560	15	.5	.23	.00	1370	1.86	55.5
APR., 1973										
18...	0	439	580	6.6	.3	.23	.02	1290	1.76	108
JUNE										
21...	11	504	900	5.4	.4	.23	.02	1770	2.41	71.7

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO2) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 6. MISSOURI RIVER BASIN

## WHITE EARTH RIVER BASIN

06332000 - WHITE EARTH RIVER AT WHITE EARTH, N. DAK. (LAT 48 22 35 LONG 102 46 00)

APR., 1973									
30...	320	0	63	6.3	1580	8.3	10.0	4.7	260
JULY									
02...	350	0	69	8.4	2050	8.4	20.0	4.8	820

## SHELL CREEK BASIN

06332520 - SHELL CREEK NEAR PARSHALL, N. DAK. (LAT 48 03 11 LONG 102 08 10)

APR., 1973									
30...	300	0	78	13	2570	8.4	9.0	5.2	940
JULY									
02...	310	0	77	12	2490	8.3	19.0	6.7	340

## LITTLE MISSOURI RIVER BASIN

06335000 - LITTLE BEAVER CREEK NEAR MARMARTH, N. DAK. (LAT 46 16 29 LONG 103 58 33)

APR., 1973									
11...	340	0	63	6.4	1660	8.2	5.5	5.0	0
JULY									
10...	270	0	65	6.4	1510	8.3	24.5	3.7	390

06335500 - LITTLE MISSOURI RIVER AT MARMARTH, N. DAK. (LAT 46 17 44 LONG 103 55 06)

NOV., 1972									
14...	300	0	69	8.5	2020	8.2	5	5.4	510
APR., 1973									
11...	340	1	66	7.3	1880	8.0	10.5	6.6	260
MAY									
09...	350	140	54	4.4	1410	8.2	14.0	2.5	280
JULY									
10...	310	53	59	5.2	1450	8.3	25.0	2.5	0

06336000 - LITTLE MISSOURI RIVER AT MEDORA, N. DAK. (LAT 46 55 10 LONG 103 31 40)

APR., 1973									
19...	450	100	63	7.4	2280	8.3	12.0	3.4	220
JUNE									
21...	250	140	68	6.9	1560	8.0	17.0	2.1	220

## KNIFE RIVER BASIN

06339100 - KNIFE RIVER AT MANNING, N. DAK. (LAT 47 14 10 LONG 102 46 10)

APR., 1973									
09...	240	0	69	7.0	1470	8.1	5.0	5.8	170
JULY									
05...	300	0	78	13	2500	8.1	23.0	8.3	340

06339300 - KNIFE RIVER AT MARSHALL, N. DAK. (LAT 47 08 17 LONG 102 20 00)

APR., 1973									
20...	380	0	67	8.0	2100	8.2	11.0	5.8	130
JUNE									
22...	370	0	72	10	2420	8.1	24.0	8.3	280

06339490 - ELM CREEK NEAR GOLDEN VALLEY, N. DAK. (LAT 47 06 25 LONG 102 03 05)

APR., 1973									
18...	280	0	69	7.8	1700	7.9	10.5	10	0
JUNE									
21...	420	0	67	8.7	2310	8.2	17.0	5.7	30

06339500 - KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK. (LAT 47 09 40 LONG 102 03 39)

OCT., 1972									
16...	350	0	69	8.6	2050	8.0	6.0	10	1200
APR., 1973									
18...	360	0	65	7.2	1840	8.2	12.0	5.4	600
JUNE									
21...	450	0	68	9.3	2490	8.4	20.0	3.9	160

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
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## PART 6. MISSOURI RIVER BASIN

## KNIFE RIVER BASIN

## 06340000 - SPRING CREEK AT ZAP, N. DAK. (LAT 47 17 10 LONG 101 55 31)

APR., 1973										
18...	1545	16	6.0	0	70	79	54	190	7.5	458
JUNE										
21...	1740	14	10	230	10	78	52	240	7.7	509

## 06340200 - WEST BRANCH OTTER CREEK NEAR BEULAH, N. DAK. (LAT 47 08 05 LONG 101 39 35)

APR., 1973										
26...	1600	.81	2.0	80	60	77	66	340	9.2	531

## 06340500 - KNIFE RIVER AT HAZEN, N. DAK. (LAT 47 17 06 LONG 101 37 26)

APR., 1973										
18...	1400	79	5.6	360	40	71	43	220	7.6	480
JUNE										
22...	1050	53	8.8	40	20	73	53	330	8.1	555

## SQUARE BUTTE CREEK BASIN

## 06342100 - SQUARE BUTTE CREEK TRIBUTARY NO 2 NEAR CENTER, N. DAK. (LAT 47 06 40 LONG 101 15 05)

APR., 1973										
26...	1220	.47	3.3	140	40	52	36	150	6.8	565

## 06342260 - SQUARE BUTTE CREEK BELOW CENTER, N. DAK. (LAT 47 03 25 LONG 101 11 35)

APR., 1973										
26...	1030	1.8	12	40	150	57	33	130	5.6	475
JULY										
26...	1330	1.4	18	270	60	55	27	130	6.0	462

## BURNT CREEK BASIN

## 06342450 - BURNT CREEK NEAR BISMARCK, N. DAK. (LAT 46 54 54 LONG 100 48 48)

APR., 1973										
23...	1630	3.2	2.3	140	20	59	53	110	7.4	443
JUNE										
27...	1245	.04	1.8	110	80	44	58	160	7.0	496

## HEART RIVER BASIN

## 06344600 - GREEN RIVER NEAR NEW HRADEC, N. DAK. (LAT 47 01 40 LONG 103 03 10)

APR., 1973										
19...	1645	5.6	3.0	100	40	50	39	190	5.9	427
JUNE										
20...	1435	12	5.7	190	80	47	43	380	6.5	539

## 06345000 - GREEN RIVER NEAR GLADSTONE, N. DAK. (LAT 46 53 40 LONG 102 37 25)

APR., 1973										
20...	1620	44	4.8	140	90	102	93	200	7.2	413
JUNE										
29...	1515	5.5	7.3	230	30	69	48	270	7.0	503

## 06345500 - HEART RIVER NEAR RICHARDTON, N. DAK. (LAT 46 44 46 LONG 102 18 27)

APR., 1973										
20...	1420	151	2.0	160	80	110	91	250	8.7	402
JUNE										
29...	1135	18	6.7	260	30	88	66	250	8.6	419

## 06347000 - ANTELOPE CREEK NEAR CARSON, N. DAK. (LAT 46 31 50 LONG 101 38 25)

APR., 1973										
23...	1500	23	4.2	60	40	80	77	130	8.1	474
JULY										
25...	1430	.56	8.1	290	60	64	61	140	8.2	403

## 06348000 - HEART RIVER NEAR LARK, N. DAK. (LAT 46 36 37 LONG 101 22 54)

APR., 1973										
25...	1000	260	3.5	20	10	60	42	130	8.0	303
JULY										
24...	1000	150	3.0	60	10	68	44	140	8.3	273

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
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PART 6. MISSOURI RIVER BASIN

KNIFE RIVER BASIN

06340000 - SPRING CREEK AT ZAP, N. DAK. (LAT 47 17 10 LONG 101 55 31)

APR., 1973										
18...	0	376	440	7.0	.3	.23	.02	977	1.33	42.2
JUNE										
21...	0	418	500	5.0	.4	.23	.05	1190	1.62	45.0

06340200 - WEST BRANCH OTTER CREEK NEAR BEULAH, N. DAK. (LAT 47 08 05 LONG 101 39 35)

APR., 1973										
26...	0	436	760	6.6	.2	.23	.03	1560	2.12	3.41

06340500 - KNIFE RIVER AT HAZEN, N. DAK. (LAT 47 17 06 LONG 101 37 26)

APR., 1973										
18...	0	394	440	6.4	.2	.23	.02	1020	1.39	218
JUNE										
22...	0	455	640	4.3	.4	.45	.04	1440	1.96	206

SQUARE BUTTE CREEK BASIN

06342100 - SQUARE BUTTE CREEK TRIBUTARY NO 2 NEAR CENTER, N. DAK. (LAT 47 06 40 LONG 101 15 05)

APR., 1973										
26...	5	472	150	4.9	.1	.23	.05	674	.92	.86

06342260 - SQUARE BUTTE CREEK BELOW CENTER, N. DAK. (LAT 47 03 25 LONG 101 11 35)

APR., 1973										
26...	0	390	160	6.2	.3	.23	.00	646	.88	3.14
JULY										
26...	0	379	140	4.6	.4	.23	.01	642	.87	2.43

BURNT CREEK BASIN

06342450 - BURNT CREEK NEAR BISMARCK, N. DAK. (LAT 46 54 54 LONG 100 48 48)

APR., 1973										
23...	7	375	240	6.2	.1	.23	.02	707	.96	6.11
JUNE										
27...	0	407	280	3.7	.2	.23	.06	830	1.13	.09

HEART RIVER BASIN

06344600 - GREEN RIVER NEAR NEW HRADEC, N. DAK. (LAT 47 01 40 LONG 103 03 10)

APR., 1973										
19...	0	350	330	6.4	.3	.45	.02	865	1.18	13.1
JUNE										
20...	0	442	630	3.9	.4	.23	.08	1420	1.93	46.0

06345000 - GRFFN RIVER NEAR GLADSTONE, N. DAK. (LAT 46 53 40 LONG 102 37 25)

APR., 1973										
20...	0	339	690	11	.4	.23	.01	1350	1.84	160
JUNE										
29...	0	413	530	6.0	.4	.23	.03	1180	1.61	17.5

06345500 - HEART RIVER NEAR RICHARDTON, N. DAK. (LAT 46 44 46 LONG 102 18 27)

APR., 1973										
20...	0	330	840	11	.3	.23	.01	1590	2.16	649
JUNE										
29...	0	344	690	13	.3	.45	.02	1340	1.82	65.1

06347000 - ANTELOPE CREEK NEAR CARSON, N. DAK. (LAT 46 31 50 LONG 101 38 25)

APR., 1973										
23...	0	389	380	8.5	.2	.23	.01	920	1.25	57.1
JULY										
25...	0	331	360	8.0	.5	.23	.04	896	1.22	1.35

06348000 - HEART RIVER NEAR LARK, N. DAK. (LAT 46 36 37 LONG 101 22 54)

APR., 1973										
25...	0	249	350	6.8	.2	.56	.02	755	1.03	530
JULY										
24...	0	224	410	7.6	.3	.34	.00	867	1.18	351



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA, MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 6. MISSOURI RIVER BASIN

## KNIFE RIVER BASIN

06340000 - SPRING CREEK AT ZAP, N. DAK. (LAT 47 17 10 LONG 101 55 31)

APR., 1973									
18...	420	44	49	4.0	1450	8.1	11.5	5.8	210
JUNE									
21...	410	0	56	5.2	1660	8.0	20.5	8.1	310

06340200 - WEST BRANCH OTTER CREEK NEAR BEULAH, N. DAK. (LAT 47 08 05 LONG 101 39 35)

APR., 1973									
26...	460	28	61	6.9	2130	8.2	9.5	5.4	170

06340500 - KNIFE RIVER AT HAZEN, N. DAK. (LAT 47 17 06 LONG 101 37 26)

APR., 1973									
18...	350	0	57	5.1	1470	8.2	11.5	4.8	0
JUNE									
22...	400	0	64	7.2	1990	8.1	19.5	7.1	250

## SQUARE BUTTE CREEK BASIN

06342100 - SQUARE BUTTE CREEK TRIBUTARY NO 2 NEAR CENTER, N. DAK. (LAT 47 06 40 LONG 101 15 05)

APR., 1973									
26...	280	0	53	3.9	1050	8.3	9.5	4.6	130

06342260 - SQUARE BUTTE CREEK BELOW CENTER, N. DAK. (LAT 47 03 25 LONG 101 11 35)

APR., 1973									
26...	280	0	50	3.4	995	8.2	8.5	4.8	0
JULY									
26...	250	0	52	3.6	951	8.2	22.0	4.7	220

## BURNT CREEK BASIN

06342450 - BURNT CREEK NEAR BISMARCK, N. DAK. (LAT 46 54 54 LONG 100 48 48)

APR., 1973									
23...	370	0	39	2.5	1050	8.3	11.5	3.7	90
JUNE									
27...	350	0	49	3.7	1240	8.1	16.0	6.3	190

## HEART RIVER BASIN

06344600 - GREEN RIVER NEAR NEW HRADEC, N. DAK. (LAT 47 01 40 LONG 103 03 10)

APR., 1973									
19...	290	0	59	4.9	1280	8.1	12.0	5.4	90
JUNE									
20...	290	0	73	9.6	1990	8.2	16.0	5.4	570

06345000 - GREEN RIVER NEAR GLADSTONE, N. DAK. (LAT 46 53 40 LONG 102 37 25)

APR., 1973									
20...	640	300	40	3.4	1820	7.9	11.0	8.3	160
JUNE									
29...	370	0	61	6.1	1700	8.2	25.5	5.1	500

06345500 - HEART RIVER NEAR RICHARDTON, N. DAK. (LAT 46 44 46 LONG 102 18 27)

APR., 1973									
20...	650	320	45	4.3	2070	8.1	11.0	5.1	130
JUNE									
29...	490	150	52	4.9	1870	8.0	22.5	6.7	410

06347000 - ANTELOPE CREEK NEAR CARSON, N. DAK. (LAT 46 31 50 LONG 101 38 25)

APR., 1973									
23...	520	130	35	2.5	1330	8.2	12.0	4.8	170
JULY									
25...	410	80	42	3.0	1290	8.0	23.0	6.4	650

06348000 - HEART RIVER NEAR LARK, N. DAK. (LAT 46 36 37 LONG 101 22 54)

APR., 1973									
25...	320	74	46	3.2	1090	8.1	9.0	3.9	260
JULY									
24...	350	130	46	3.3	1210	8.1	20.0	3.5	170

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
 CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

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DATE	TIME	DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SIO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (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 (HCO <sub>3</sub> ) (MG/L)
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PART 6. MISSOURI RIVER BASIN

HEART RIVER BASIN

06348500 - SWEETBRIAR CREEK NEAR JUDSON, N. DAK. (LAT 46 51 06 LONG 101 15 10)

APR., 1973										
27...	1100	3.9	.7	80	80	30	19	100	7.3	279
JULY										
23...	1300	.37	2.6	80	0	20	41	340	6.1	493

CANNONBALL RIVER BASIN

06350000 - CANNONBALL RIVER AT REGENT, N. DAK. (LAT 46 25 36 LONG 102 33 05)

APR., 1973										
13...	1215	32	1.0	300	100	100	93	290	6.9	373
JUNE										
15...	1600	16	--	--	--	--	--	--	--	--
JULY										
13...	1335	3.4	5.7	0	180	120	120	490	8.4	489

06351680 - WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, N. DAK. (LAT 46 19 20 LONG 102 59 45)

APR., 1973										
10...	1245	3.4	.6	160	680	210	270	660	7.8	524
JULY										
09...	1355	.02	1.3	100	380	180	280	920	12	456

06352000 - CEDAR CREEK NEAR HAYNES, N. DAK. (LAT 46 09 15 LONG 102 28 25)

NOV., 1972										
15...	1110	22	3.3	100	--	190	170	400	10	456
APR., 1973										
13...	1010	31	.6	280	60	140	150	330	12	400
MAY										
11...	0955	15	1.7	30	250	180	200	530	10	506
JULY										
13...	1015	1.8	5.6	20	160	130	150	500	11	498

06353000 - CEDAR CREEK NEAR RALEIGH, N. DAK. (LAT 46 05 00 LONG 101 20 00)

APR., 1973										
23...	1100	97	1.8	320	40	120	100	260	12	392
JULY										
25...	1100	14	6.6	80	40	57	50	250	8.0	274

JAMES RIVER BASIN

06467600 - JAMES RIVER NEAR MANFRED, N. DAK. (LAT 47 38 40 LONG 099 49 40)

APR., 1973										
30...	1400	.06	16	140	60	65	34	130	7.1	466

06468170 - JAMES RIVER NEAR GRACE CITY, N. DAK. (LAT 47 33 29 LONG 098 51 45)

MAY, 1973										
08...	1530	.09	7.3	20	10	35	34	260	10	526

06469500 - PIPESTEM CREEK NEAR RICHMAN, N. DAK. (LAT 47 03 59 LONG 098 55 07)

MAY, 1973										
08...	1200	2.0	5.2	100	240	58	43	87	9.3	343

06470000 - JAMES RIVER AT JAMESTOWN, N. DAK. (LAT 46 53 22 LONG 098 40 58)

MAY, 1973										
08...	1230	7.3	8.0	80	700	75	41	110	8.8	381
JULY										
23...	1600	12	20	20	80	56	24	110	7.2	384

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SURFACE-WATER QUALITY SITES  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	ALKA- LINITY AS CACO <sub>3</sub> (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (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)
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## PART 6. MISSOURI RIVER BASIN

## HEART RIVER BASIN

06348500 - SWEETBRIAR CREEK NEAR JUDSON, N. DAK. (LAT 46 51 06 LONG 101 15 10)

APR., 1973										
27...	0	229	150	4.4	.2	.56	.01	463	.63	4.88
JULY										
23...	46	481	480	4.5	.8	.23	.06	1190	1.62	1.19

## CANNONBALL RIVER BASIN

06350000 - CANNONBALL RIVER AT REGENT, N. DAK. (LAT 46 25 36 LONG 102 33 05)

APR., 1973										
13...	0	306	950	11	.2	.23	.00	1640	2.23	142
JUNE										
15...	--	--	--	--	--	--	--	--	--	--
JULY										
13...	0	401	1400	11	.4	.29	.05	2450	3.33	22.5

06351680 - WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, N. DAK. (LAT 46 19 20 LONG 102 59 45)

APR., 1973										
10...	0	430	2610	21	.3	.23	.01	4300	5.85	39.5
JULY										
09...	0	374	3200	20	.4	.23	.02	5140	6.99	.28

06352000 - CEDAR CREEK NEAR HAYNES, N. DAK. (LAT 46 09 15 LONG 102 28 25)

NOV., 1972										
15...	0	374	1700	17	.4	2.0	--	2820	3.84	168
APR., 1973										
13...	0	328	1300	14	.2	.23	--	2210	3.01	185
MAY										
11...	0	415	1900	18	.4	--	--	3230	4.39	134
JULY										
13...	0	408	1600	12	.4	.23	.04	2770	3.77	13.5

06353000 - CEDAR CREEK NEAR RALEIGH, N. DAK. (LAT 46 05 00 LONG 101 20 00)

APR., 1973										
23...	0	322	900	11	.2	.23	.02	1590	2.16	417
JULY										
25...	0	225	650	6.9	.4	.23	.05	1190	1.62	45.0

## JAMES RIVER BASIN

06467600 - JAMES RIVER NEAR MANFRED, N. DAK. (LAT 47 38 40 LONG 099 49 40)

APR., 1973										
30...	0	382	160	16	.2	.56	.03	717	.98	.12

06468170 - JAMES RIVER NEAR GRACE CITY, N. DAK. (LAT 47 33 29 LONG 098 51 45)

MAY, 1973										
08...	0	431	240	96	.2	.56	.16	969	1.32	.24

06469500 - PIPESTEM CREEK NEAR BUCHANAN, N. DAK. (LAT 47 03 59 LONG 098 55 07)

MAY, 1973										
08...	0	281	200	27	.1	.23	.05	613	.83	3.31

06470000 - JAMES RIVER AT JAMESTOWN, N. DAK. (LAT 46 53 22 LONG 098 40 58)

MAY, 1973										
08...	0	313	210	37	.2	.45	.06	684	.93	13.5
JULY										
23...	0	315	120	37	.5	.56	.14	605	.82	19.6

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	CARBON DIOXIDE (CO <sub>2</sub> ) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
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## PART 6. MISSOURI RIVER BASIN

## HEART RIVER BASIN

06348500 - SWEETBRIAR CREEK NEAR JUDSON, N. DAK. (LAT 46 51 06 LONG 101 15 10)

APR., 1973									
27...	150	0	57	3.5	716	8.1	9.5	3.5	30
JULY									
23...	220	0	77	10	1770	8.9	20.0	1.2	220

## CANNONBALL RIVER BASIN

06350000 - CANNONBALL RIVER AT REGENT, N. DAK. (LAT 46 25 36 LONG 102 33 05)

APR., 1973									
13...	630	330	50	5.0	2180	7.8	11.0	9.5	0
JUNE									
15...	--	--	--	--	3310	--	21.5	--	--
JULY									
13...	790	390	57	7.6	3080	8.0	22.5	7.8	1200

06351680 - WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, N. DAK. (LAT 46 19 20 LONG 102 59 45)

APR., 1973									
10...	1600	1200	47	7.1	4730	8.0	7.0	8.4	1300
JULY									
09...	1600	1200	55	10	5690	7.8	27.0	12	1600

06352000 - CEDAR CREEK NEAR HAYNES, N. DAK. (LAT 46 09 15 LONG 102 28 25)

NOV., 1972									
15...	1200	830	42	5.1	3210	8.1	.5	5.8	1100
APR., 1973									
13...	970	640	42	4.6	2680	7.8	10.0	10	260
MAY									
11...	1300	860	47	6.5	3620	8.1	12.0	6.4	1100
JULY									
13...	940	530	53	7.1	3390	8.1	21.5	6.3	650

06353000 - CEDAR CREEK NEAR RALEIGH, N. DAK. (LAT 46 05 00 LONG 101 20 00)

APR., 1973									
23...	710	390	44	4.2	2140	8.2	10.0	4.0	600
JULY									
25...	350	120	60	5.8	1680	7.8	21.5	6.9	600

## JAMES RIVER BASIN

06467600 - JAMES RIVER NEAR MANFRED, N. DAK. (LAT 47 38 40 LONG 099 49 40)

APR., 1973									
30...	300	0	48	3.3	1020	8.1	12.0	5.9	90

06468170 - JAMES RIVER NEAR GRACE CITY, N. DAK. (LAT 47 33 29 LONG 098 51 45)

MAY, 1973									
08...	230	0	70	7.5	1510	8.0	13.5	8.4	310

06469500 - PIPESTEM CREEK NEAR BUCHANAN, N. DAK. (LAT 47 03 59 LONG 098 55 07)

MAY, 1973									
08...	320	40	36	2.1	929	8.1	16.5	4.4	160

06470000 - JAMES RIVER AT JAMESTOWN, N. DAK. (LAT 46 53 22 LONG 098 40 58)

MAY, 1973									
08...	360	44	39	2.5	1140	8.0	13.5	6.1	310
JULY									
23...	240	0	49	3.1	927	7.7	8.0	12	470

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS GROUND-WATER QUALITY SITES

LOCAL IDENT- IFIER	STATION	NUMBER	DATE OF SAMPLE	TOTAL DEPTH OF WELL (FT)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)
BARNES COUNTY										
137-058-34CCC	463755097594501	73-08-22	26	25	80	520	65	21	32	
140-061-31DDA	465343098251101	73-08-22	150	26	670	1600	110	26	81	
142-061-09DDD	470732098242001	73-08-23	226	25	120	720	86	33	350	
142-061-248CC2	470613098213902	73-08-23	284	24	190	740	60	22	230	
CASS COUNTY										
137-049-25CCC	483848096490601	73-07-19	240	26	3200	250	180	68	140	
137-52-31888	463836097180801	73-07-19	20	26	760	620	130	69	74	
138-049-29CCC	464359096541301	73-07-19	280	24	830	200	110	38	280	
139-049-18888	465140096553001	73-07-23	210	27	100	200	31	40	380	
139-049-22888	465049096514001	73-07-20	236	25	1100	170	65	21	120	
140-049-36AAA	465419096480201	73-07-17	228	25	8700	3300	290	160	210	
GRAND FORKS COUNTY										
150-054-04CCD	474957097342501	73-07-10	40	24	150	960	98	26	16	
153-055-04CCD	480539097433101	73-07-10	30	24	1300	1400	100	19	8.5	
153-055-32AAA	480205097410601	73-07-10	20	24	80	170	77	19	44	
154-055-14CCC	480908097410601	73-07-09	60	24	2400	800	93	14	3.7	
NELSON COUNTY										
149-059-02888	474532098105501	73-08-01	240	26	790	1000	32	58	100	
150-060-05888	483732098250901	73-08-03	123	27	120	1100	32	66	62	
150-061-30A88	474712098304401	73-08-01	240	28	60	120	61	29	260	
RANSOM COUNTY										
135-053-16CCC	463001097214601	73-07-31	40	26	2100	1400	69	19	6.5	
RICHLAND COUNTY										
129-050-05888	460118096592201	73-07-26	140	26	660	420	160	46	27	
130-050-278882	460300096565001	73-07-26	100	26	580	560	92	58	15	
134-052-030002	462633097115502	73-07-31	50	27	2200	330	81	36	11	
136-052-03AAA2	463744097115602	73-07-24	25	23	0	580	62	35	4.3	
TRAILL COUNTY										
144-051-12DCC	471749097044501	73-07-12	120	22	23000	870	440	140	170	
145-051-01DDC	472352097054401	73-07-12	90	24	9400	920	320	97	140	
145-053-16888	472252097254801	73-07-12	35	22	190	920	90	28	9.2	
146-053-29888	472623097270401	73-07-12	40	24	3700	2200	41	12	3.6	
147-051-22888	473228097091501	73-07-12	100	25	1600	320	87	32	570	
WALSH COUNTY										
156-056-16CC8	481939097513201	73-08-08	40	22	700	620	91	35	41	
156-056-36CCC1	481657097473601	73-08-08	30	21	450	1200	83	23	14	

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS GROUND-WATER QUALITY SITES

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LOCAL IDENT- IFIER	DATE OF SAMPLE	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED BORON (B) (UG/L)
BARNES COUNTY										
137-058-34CCC	73-08-22	3.1	242	0	199	96	8.3	.3	1.4	2400
140-061-31DDA	73-08-22	7.8	427	0	350	200	7.6	.3	.61	560
142-061-09DDO	73-08-23	8.9	510	0	418	580	100	.4	.29	1000
142-061-24RCC2	73-08-23	8.0	506	0	415	270	55	.3	1.5	0
CASS COUNTY										
137-049-25CCC	73-07-19	7.4	427	0	350	590	58	.2	.23	260
137-52-31888	73-07-19	15	916	0	751	29	3.2	.1	.23	0
138-049-29CCC	73-07-19	6.1	282	0	231	360	310	.5	.45	390
139-049-18888	73-07-23	8.0	455	0	373	77	440	.5	1.1	390
139-049-22888	73-07-20	6.8	357	0	293	110	75	.4	.56	340
140-049-36AAA	73-07-17	7.1	591	0	485	1300	25	.3	.75	430
GRAND FORKS COUNTY										
150-054-04CCD	73-07-10	6.6	326	0	267	89	18	.7	.23	3200
153-055-04CCD	73-07-10	6.3	374	0	307	51	6.0	.1	.23	3200
153-055-32AAA	73-07-10	6.3	307	0	252	89	9.3	.2	4.3	3100
154-055-14CCC	73-07-09	2.5	258	0	212	78	5.2	.1	.23	3100
NELSON COUNTY										
149-059-02888	73-08-01	6.2	399	0	327	180	25	.3	.36	40
150-060-05888	73-08-03	6.0	394	0	323	140	8.8	.2	.23	170
150-061-30A88	73-08-01	8.0	456	0	374	340	78	.4	1.5	390
RANSOM COUNTY										
135-053-16CCC	73-07-31	2.0	290	0	238	17	5.9	.2	.23	0
RICHLAND COUNTY										
129-050-05888	73-07-26	8.2	371	0	304	310	6.4	.2	.20	40
130-050-278882	73-07-26	4.6	357	0	293	220	4.2	.2	.23	0
134-052-03DDO2	73-07-31	5.6	438	0	359	8.6	2.5	.3	.23	40
136-052-03AAA2	73-07-24	2.0	353	0	290	19	3.0	.3	.23	0
TRAILL COUNTY										
144-051-12DCC	73-07-12	12	389	0	319	1500	170	.2	1.3	3400
145-051-01DDC	73-07-12	9.8	352	0	289	1000	150	.1	.25	3400
145-053-16888	73-07-12	6.3	299	0	245	86	16	.1	.23	3100
146-053-29888	73-07-12	9.8	185	0	152	24	3.2	.1	.23	3100
147-051-22888	73-07-12	20	315	0	258	730	420	2.3	.07	4800
WALSH COUNTY										
156-056-16CC8	73-08-08	6.1	291	0	239	190	14	.2	.23	130
156-056-36CCC1	73-08-08	7.9	273	0	224	100	8.1	.2	.56	520



## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS GROUND-WATER QUALITY SITES

LOCAL IDENT- IFIER	DATE OF SAMPLE	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	SODIUM AD- SURP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
BARNES COUNTY								
137-058-34CCC	73-08-22	406	250	52	.9	571	8.0	8.0
140-061-31DDA	73-08-22	703	380	32	1.8	1010	7.8	7.0
142-061-09DDD	73-08-23	1460	350	0	8.1	2130	7.8	9.0
142-061-24RCC2	73-08-23	955	240	0	6.5	1430	7.7	9.0
CASS COUNTY								
137-049-25CCC	73-07-19	1310	730	380	2.3	1760	7.9	8.0
137-52-31RBB	73-07-19	783	610	0	1.3	1300	8.0	8.0
138-049-29CCC	73-07-19	1320	430	200	5.9	2090	8.1	8.0
139-049-18RBB	73-07-23	1290	240	0	11	2190	8.0	8.0
139-049-22RBB	73-07-20	612	250	0	3.3	1000	8.0	8.0
140-049-36AAA	73-07-17	2490	1400	900	2.5	2800	8.0	8.0
GRAND FORKS COUNTY								
150-054-04CCD	73-07-10	472	350	84	.4	715	8.1	7.5
153-055-04CCD	73-07-10	425	330	21	.2	647	8.0	6.0
153-055-32AAA	73-07-10	454	270	19	1.2	695	8.0	7.0
154-055-14CCC	73-07-09	379	290	78	.1	555	8.0	7.5
NELSON COUNTY								
149-059-02RBB	73-08-01	656	320	0	2.4	986	7.9	8.0
150-060-05RBB	73-08-03	584	350	28	1.4	855	8.1	8.0
150-061-30ABB	73-08-01	1010	270	0	6.9	1540	8.0	8.5
RANSOM COUNTY								
135-053-16CCC	73-07-31	253	250	13	.2	453	8.0	8.0
RICHLAND COUNTY								
129-050-05RBB	73-07-26	830	590	290	.5	1060	7.6	8.0
130-050-27RBB2	73-07-26	667	470	180	.3	900	7.6	8.0
134-052-03DDD2	73-07-31	356	350	0	.3	643	8.0	7.5
136-052-03AAA2	73-07-24	355	300	9	.1	545	8.0	--
TRAILL COUNTY								
144-051-12DCC	73-07-12	2890	1700	1400	1.8	3170	7.6	8.0
145-051-01DDC	73-07-12	2020	1200	910	1.8	2500	7.7	8.0
145-053-16RBB	73-07-12	467	340	95	.2	684	8.2	10.0
146-053-29RBB	73-07-12	209	150	0	.1	330	7.7	7.5
147-051-22RBB	73-07-12	2100	350	91	13	2980	7.7	7.0
WALSH COUNTY								
156-056-16CCB	73-08-08	574	370	130	.9	806	8.0	8.0
156-056-36CCC1	73-08-08	446	300	78	.4	624	7.9	6.5

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