

Quality of Surface Waters of the United States, 1968

Parts 4 and 5. St. Lawrence River Basin, and
Hudson Bay and Upper Mississippi River Basins

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 2094

*Prepared in cooperation with the States
of Illinois, Indiana, Iowa, Michigan,
Minnesota, Missouri, New York, Ohio,
South Dakota, Wisconsin, and with
other agencies*



UNITED STATES DEPARTMENT OF THE INTERIOR

ROGERS C. B. MORTON, *Secretary*

GEOLOGICAL SURVEY

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Library of Congress catalog-card No. GS 43-68

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 — Price \$2.10 domestic postpaid or \$1.75 GPO Bookstore
Stock Number 2401-02380

PREFACE

This report was prepared by the U.S. Geological Survey in cooperation with the States of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, New York, Ohio, South Dakota, Wisconsin, and with other agencies, by personnel of the Water Resources Division, E. L. Hendricks, chief hydrologist, G. W. Whetstone, assistant chief hydrologist for Scientific Publications and Data Management, under the general direction of G. A. Billingsley, chief, Reports Section, and B. A. Anderson, chief, Data Reports Unit.

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QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1968

PARTS 4 and 5

INTRODUCTION

The water-quality investigations of the United States Geological Survey are concerned with chemical and physical characteristics of surface- and ground-water supplies of the Nation. The data herein deal with the amounts of matter in solution and in suspension in streams, and represent that portion of the National Water Data System collected by the U.S. Geological Survey in cooperation with State, municipal, and other Federal agencies.

The records of chemical analysis, water temperature, and suspended sediment of surface waters given in this volume serve as a basis for determining the suitability of waters for various uses. The flow and water quality of a stream are related to variations in rainfall and other forms of precipitation. In general, lower concentrations of dissolved solids may be expected during periods of high flow than during periods of low flow. Conversely, the suspended solids in some streams may change materially with relatively small variations in flow, whereas for other streams the quality of the water may remain relatively uniform throughout large ranges in discharge.

The Geological Survey has published annual records of chemical quality, water temperature, and suspended sediment since 1941. The records prior to 1948 were published each year in a single volume for the entire country, and in two volumes in 1948 and in 1949. From 1950 to 1958, the records were published in 4 volumes; from 1959 to 1963 in 5 volumes; from 1964 to 1967 in 6 volumes; and since 1968 in 10 volumes. The drainage basins covered by the 10 volumes are shown in Figure 1. The shaded area in Figure 1 represents the section of the country covered in this volume for the water year 1968 (October 1, 1967 to September 30, 1968).

To meet interim requirements, water-quality records have been released by the Geological Survey in annual reports, beginning with the 1964 water year, by State. These reports are entitled, "Water Resources Data for (State), Part 2. Water Quality Records." Distribution of these reports is limited and primarily for local needs. Any revisions or corrections found necessary to the records published in these annual State reports have been made and published in this volume without reference.

The records herein are listed by drainage basins in a downstream direction along the main stream. All stations on a tributary entering above a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. In the list of water-quality stations in the front of this volume, the rank of the tributaries is indicated by an indentation. Each indentation represents one rank.

As an added means of identification, a station number has been assigned for each stream location where regular measurements of water quantity or quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of an 8-digit number, such as 04106500. The first 2 digits, "04" identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The next 6 digits is the

station number which represents the location of the station in the standard downstream order within each of the 16 parts (Fig. 1). The complete number (04106500) appears just to the left of the station name. The assigned numbers are in numerical order but are not consecutive. Gaps are left in the numbers to allow for new stations that may be established.

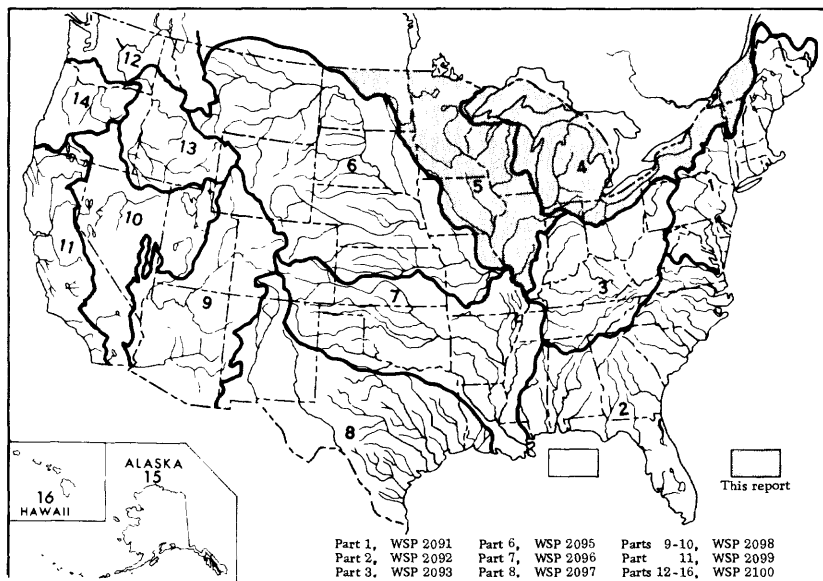


Figure 1.--Map of the United States showing basins covered by the 10 water-supply papers on quality of surface waters in 1968. The shaded part represents the section of the country covered by this volume; the unshaded part represents the section of the country covered by other water-supply papers.

Descriptive statements are given for each sampling station where chemical analyses, temperature measurements, or sediment determinations have been made. These statements include location of the station, drainage area, periods of records available, extremes of dissolved solids, hardness, specific conductance, temperature, sediment loads, and other pertinent data. Records of discharge of the streams at or near the sampling station are included in most tables of analyses.

During the water year ending September 30, 1968, the Geological Survey maintained 139 stations on 93 streams for the study of chemical and physical characteristics of surface water. Samples were collected daily and monthly at 81 of these locations for chemical-quality studies. Samples also were collected less frequently at many other points. Water temperatures were measured continuously at 59 and daily at 24 stations. All surface water samples collected and analyzed during the year have not been reported. Single analyses made of daily samples before compositing have not been reported. Specific conductance is determined and reported for almost all daily samples.

At chemical-quality stations where data are continuously recorded at the stream site (monitors), the records consist of daily maximum, minimum, and mean values for each constituent measured. More detailed records (hourly values) may be obtained by writing the district office listed under Division of Work on page 21.

Quantities of suspended sediment are reported for 24 stations during the year ending September 30, 1968. Sediment samples were collected one or more times daily at most stations, depending on the rate of flow and changes in stage of the stream. Particle-size distributions of sediments were determined only at miscellaneous sites.

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

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

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

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

Pesticide program is a network of regularly sampled 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.

Radiochemical program is a network of regularly sampled 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.

COLLECTION AND EXAMINATION OF DATA

Quality of water stations usually are located at or near points on streams where streamflow is measured by the U.S. Geological Survey. The concentration of solutes and sediments at different locations in the stream-cross section may vary widely with different rates of water discharge depending on the source of the material and the turbulence and mixing of the stream. In general, the distribution of sediment in a stream section is much more variable than the distribution of solutes. It is necessary to sample some streams at several verticals across the channel and especially for sediment, to uniformly traverse the depth of flow. These measurements require special sampling equipment to adequately integrate the vertical and lateral variability of the concentration in the section. These procedures yield a velocity-weighted mean concentration for the section.

The near uniformly dispersed ions of the solute load move with the velocity of the transporting water. Accordingly, the mean section concentration of solutes determined from samples is a precise measure of the total solute load. The mean section concentration obtained from suspended sediment samples is a less precise measure of the total sediment load, because the sediment samplers do not traverse the bottom 0.3 foot of the sampling vertical where the concentration of suspended sediment is greatest and because a significant part of the coarser particles in many streams move in essentially continuous contact with the bed and are not represented in the suspended sediment sample. Hence, the computed sediment loads presented

in this report are usually less than the total sediment loads. For most streams the difference between the computed and total sediment loads will be small, in the order of a few percent.

CHEMICAL QUALITY

The methods of collecting and compositing water samples for chemical analysis are described by Rainwater and Thatcher (1960) and by Brown, Skougstad, and Fishman (1970). No single method of compositing samples is applicable to all problems related to the study of water quality. Composites are made on the basis of dissolved-solids content as indicated by measurements of conductivity of daily samples, supplemented by other information such as chloride content, river stage, weather conditions and other background information of the stream.

TEMPERATURE

Daily water temperatures were measured at most of the stations at the time samples were collected for chemical quality or sediment content. So far as practicable, the water temperatures were taken at about the same time each day. Large streams have a small diurnal temperature change while small, shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

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

SEDIMENT

In general, suspended-sediment samples were collected daily with depth-integrating samplers (U.S. Inter-Agency, 1963). At some stations, samples were collected at a fixed sampling point at one vertical in the cross section. Depth-integrated samples were collected periodically at three or more verticals in the cross section to determine the cross-sectional distribution of the concentration of suspended sediment with respect to that at the daily sampling vertical. In streams where transverse distribution of sediment concentration ranged widely, samples were taken at two or more verticals to define more accurately the average concentration of the cross section. During periods of high or rapidly changing flow, samples generally were taken several times a day and, in some instances, hourly.

Sediment concentrations were determined by filtration-evaporation method. At many stations the daily mean concentration for some days was obtained by plotting the velocity-weighted instantaneous concentrations on the gage-height chart. The plotted concentrations, adjusted if necessary, for cross-sectional distribution were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated velocity-weighted concentration at any time, and for most periods daily mean concentrations were determined from the graph. The days were divided into shorter intervals when the concentration or water discharge were changing rapidly. During some periods of minor variation in concentration, the average concentration of the samples was used as the daily mean concentration. During extended periods of relatively uniform concentration and flow, samples for a number of days were composited to obtain average concentrations and average daily loads for each period. (See Expression of Results, p.5.)

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. The estimates were further guided by precipitation records and sediment discharge at other stations in the same or adjacent basins.

In many instances where there were no observations for several days, the suspended-sediment loads for individual days were not estimated, because numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates for individual days. However, estimated loads of suspended sediment for missing days in an otherwise continuous period of sampling have been included in monthly and annual totals in order to provide a complete record. For some streams, samples were collected weekly, monthly, or less frequently, and only rates of sediment discharge at the time of sampling are shown.

In addition to the records of quantities of suspended sediment transported, records of particle sizes of sediment are included. The particle sizes of suspended sediment for many of the stations, and the particle sizes of the bed material for some of the stations were determined intermittently.

The size of particles carried in suspension by streams commonly ranges from colloids (finer than about 0.24 microns) to coarse sand (2.0 mm). The common methods of particle-size analysis cannot accommodate such a wide range. Hence, it was necessary to separate most samples into two parts, that part coarser than 0.062 mm and that part finer than 0.062 mm. The separations were made by sieve or by fall velocity technique. The coarse fractions were classified by sieve separation or by visual-accumulation tube (U.S. Inter-Agency, 1957). The fine fractions were classified by the pipet method (Kilmer and Alexander, 1949) or the bottom withdrawal tube method (U.S. Inter-Agency, 1943).

EXPRESSION OF RESULTS

The quantities of solute concentrations analyzed in the laboratory are measured in milligrams per liter. Milligrams per liter (mg/l, MG/L) is a unit which represents the weight of solute per unit volume of water.

Milliequivalents per liter are not reported but they can be converted easily from milligrams per liter data. A milliequivalent per liter (me/l) is one thousandth of a gram equivalent weight of a constituent. Chemical equivalence in milliequivalents per liter can be obtained by (a) dividing the concentration in milligrams per liter by the combining weight of that ion, or (b) by multiplying the concentration (in mg/l) by the reciprocals of the combining weights. Table 1 below, lists the reciprocals of the combining atomic weights based on carbon-12 (International Union of Pure and Applied Chemistry, 1961).

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

Ion	Multi- ply by	Ion	Multi- ply by
Aluminum (Al ⁺³)	0.11119	Iodide (I ⁻¹)	0.00788
Ammonia as NH ⁺¹ . . . . .	.05544	Iron (Fe ⁺³) . . . . .	.05372
Arsenic (As ⁺³) . . . . .	.04004	Lead (Pb ⁺²) . . . . .	.00965
Barium (Ba ⁺²) . . . . .	.01456	Lithium (Li ⁺¹) . . . . .	.14411
Bicarbonate (HCO ₃ ⁻¹) . . . . .	.01639	Magnesium (Mg ⁺²) . . . . .	.08226
Bromide (Br ⁻¹) . . . . .	.01251	Manganese (Mn ⁺²) . . . . .	.03640
Cadmium (Cd ⁺²) . . . . .	.01779	Mercury (Hg ⁺²) . . . . .	.00997
Calcium (Ca ⁺²) . . . . .	.04990	Nickel (Ni ⁺²) . . . . .	.03406
Carbonate (CO ₃ ⁻²) . . . . .	.03333	Nitrate (NO ₃ ⁻¹) . . . . .	.01613
Chloride (Cl ⁻¹) . . . . .	.02821	Nitrite (NO ₂ ⁻¹) . . . . .	.02174
Chromium (Cr ⁺⁶) . . . . .	.11539	Phosphate (PO ₄ ⁻³) . . . . .	.03159
Cobalt (Co ⁺²) . . . . .	.03394	Potassium (K ⁺¹) . . . . .	.02557
Copper (Cu ⁺²) . . . . .	.03148	Sodium (Na ⁺¹) . . . . .	.04350
Cyanide (CN ⁻¹) . . . . .	.03844	Strontium (Sr ⁺²) . . . . .	.02283
Fluoride (F ⁻¹) . . . . .	.05264	Sulfate (SO ₄ ⁻²) . . . . .	.02082
Hydrogen (H ⁺¹) . . . . .	.99209	Sulfide (S ⁻²) . . . . .	.06238
Hydroxide (OH ⁻¹) . . . . .	.05880	Zinc (Zn ⁺²) . . . . .	.03060

The hardness of water is conventionally expressed in all water analyses in terms of an equivalent quantity of calcium carbonate. Such a procedure is required because hardness is caused by several different cations, present in variable proportions. It should be remembered that hardness is an expression in conventional terms of a property of water. The actual presence of calcium carbonate in the concentration given is not to be assumed. The hardness caused by calcium and magnesium (and other cations if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness. Hardness or alkalinity values expressed in milligrams per liter as calcium carbonate may be converted to milliequivalents per liter by dividing by 50.

The value usually reported as dissolved solids is the residue on evaporation after drying at 180°C for 1 hour. For some waters, particularly those containing moderately large quantities of soluble salts, the value reported is calculated from the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. The calculated sum of the constituents may be given instead of or in addition to the residue. In the analyses of most waters used for irrigation, the quantity of dissolved solids is given in tons per acre-foot as well as in milligrams per liter.

Specific conductance is given for most analyses and was determined by means of a conductance bridge and using a standard potassium chloride solution as reference. Specific conductance values are expressed in micromhos per centimeter at 25°C. Specific conductance in micromhos is 1 million times the reciprocal of specific resistance at 25°C. Specific resistance is the resistance in ohms of a column of water 1 centimeter long and 1 square centimeter in cross section.

The discharge of the streams is reported in cubic feet per second (see Streamflow, p. 19) and the temperature in degrees Celsius (°C). Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892). A unit of color is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Hydrogen-ion concentration is expressed in terms of pH units. By definition the pH value of a solution is the negative logarithm of the concentration of gram ions of hydrogen.

An average of analyses for the water year is given for most daily sampling stations. Most of these averages are arithmetical, time-weighted, or discharge-weighted; when analyses during a year are all on 10-day composites of daily samples with no missing days, the arithmetical and time-weighted averages are equivalent. 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 river each day for the water year. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all of the water passing a given station during the year. A discharge-weighted average is computed by multiplying the discharge for the 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. For most streams, discharge-weighted averages are lower than arithmetical averages because at times of high discharge the rivers generally have low concentrations of dissolved solids.

A program for computing these averages by digital computer was instituted in the 1962 water year. This program extended computations to include averages for pH values expressed in terms of hydrogen ion and averages for the concentration of individual constituents expressed in tons per day. Concentrations in tons per day are computed the same as daily sediment loads.

The concentration of sediment in milligrams per liter is computed as 1,000,000 times the ratio of the weight of sediment to the weight of water-sediment mixture. Daily sediment loads are expressed in tons per day and except for subdivided days, are usually obtained by multiplying daily mean sediment concentrations in mg/l by the daily mean discharge in cubic feet per second, and the conversion factor, normally 0.0027.

For those days when the published sediment discharge value differs from the value computed, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method.

Particle-size analyses are expressed in percentages of material finer than classified sizes (in millimeters). The size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Clay:	Smaller than 0.004 mm
Silt:	Between 0.004 and 0.062 mm
Sand:	Between 0.062 and 2.0 mm
Gravel:	Between 2.0 and 64.0 mm

The particle-size distributions given in this report are not necessarily representative of the particle sizes of sediment in transport in the natural stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis of the silt and clay.

Prior to the 1968 water year, data for chemical constituents and concentrations of suspended sediment were reported in parts per million (ppm) and water temperatures were reported in degrees Fahrenheit (°F). In October 1967, the U.S. Geological Survey began to use the metric system; data for chemical constituents and concentrations of suspended sediment are now reported in milligrams per liter (mg/l) and water temperatures are given in degrees Celsius (centigrade, °C). In waters with a density of 1.000 g/ml (grams per milliliter), parts per million and milligrams per liter can be considered equal. In waters with a density greater than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter. (See table 2 on page 8.) To convert temperature in degrees Celsius to degrees Fahrenheit see table 3 on page 8.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils with which the water has been in contact and the length of time of contact. Ground water is generally more highly mineralized than surface runoff because it remains in contact with the rocks and soils for much longer periods. Some streams are fed by both surface runoff and ground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. The dissolved-solids content in a river is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by drainage from irrigated lands.

The mineral constituents and physical properties of natural waters reported in the tables of analyses include those that have a practical bearing on water use. The results of analyses generally include silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together calculated as sodium), carbonate, bicarbonate, sulfate, chloride, fluoride, nitrate, boron, pH, dissolved solids, and specific conductance. Aluminum, manganese, color, acidity, dissolved oxygen, and other dissolved constituents and physical properties are reported for certain streams. Microbiologic (coliforms) and organic components (pesticides, total organic carbon) and minor elements (arsenic, cobalt, cadmium, copper, lead, mercury, nickel, strontium, zinc, etc.) are determined occasionally for some streams in connection with specific problems and the results are reported. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs. The constituents are arranged in the order that they appear in the tables.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO₂)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 milligrams per liter of silica and few contain more than 50 mg/l, but the more common range is from 10 to 30 mg/l. Silica affects the usefulness of a water because it contributes to the formation of boiler scale; it usually is removed from

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

Range of concentration (ppm)	Multiply by	Range of concentration (ppm)	Multiply by
0 - 15,900	1.00	322,000 - 341,000	1.26
16,000 - 46,800	1.02	342,000 - 361,000	1.28
46,900 - 76,500	1.04	362,000 - 380,000	1.30
76,600 - 105,000	1.06	381,000 - 399,000	1.32
106,000 - 133,000	1.08	400,000 - 416,000	1.34
134,000 - 159,000	1.10	417,000 - 434,000	1.36
160,000 - 185,000	1.12	435,000 - 451,000	1.38
186,000 - 210,000	1.14	452,000 - 467,000	1.40
211,000 - 233,000	1.16	468,000 - 483,000	1.42
234,000 - 256,000	1.18	484,000 - 498,000	1.44
257,000 - 279,000	1.20	499,000 - 514,000	1.46
280,000 - 300,000	1.22	515,000 - 528,000	1.48
301,000 - 321,000	1.24	529,000 - 542,000	1.50

* Based on water density of 1,000 g/ml and sediment density of 2.65 g/cc.

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

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

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

feed water for high-pressure boilers. Silica also forms troublesome deposits on the blades of steam turbines. However, it is not physiologically significant to humans, livestock, or fish, nor is it of importance in irrigation water.

Aluminum (Al)

Aluminum is usually present only in negligible quantities in natural waters except in areas where the waters have been in contact with the more soluble rocks of high aluminum content such as bauxite and certain shales. Acid waters often contain large amounts of aluminum. It may be troublesome in feed waters where it tends to be deposited as a scale on boiler tubes.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to air, normal basic waters that contain more than 1 mg/l of iron soon become turbid with the insoluble reddish ferric compounds produced by oxidation. Surface waters, therefore, seldom contain as much as 1 mg/l of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on porcelain or enameled ware and fixtures and on fabrics washed in the water. Concentrations of more than 0.3 mg/l are not acceptable for drinking and culinary use. (U.S. Public Health Service, 1962).

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. It resembles iron in its chemical behavior and in its occurrence in natural waters. However, manganese in rocks is less abundant than iron. As a result the concentration of manganese is much less than that of iron and is not regularly determined in many areas. It is especially objectionable in water used in laundry work and in textile processing. Concentrations as low as 0.2 mg/l may cause a dark-brown or black stain on fabrics and porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Calcium (Ca)

Calcium is dissolved from almost all rocks and soils, but the highest concentrations are usually found in waters that have been in contact with limestone, dolomite, and gypsum. Calcium and magnesium make water hard and are largely responsible for the formation of boiler scale. Most waters associated with granite or silicious sands contain less than 10 mg/l of calcium; waters in areas where rocks are composed of dolomite and limestone contain from 30 to 100 mg/l; and waters that have come in contact with deposits of gypsum may contain several hundred mg/l.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 mg/l, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 mg/l or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the western United States. Natural waters that contain only 3 or 4 mg/l of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 to 100 mg/l of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that contain a large proportion of sodium salts may be unsatisfactory for irrigation.

Bicarbonate, carbonate and hydroxide (HCO_3 , CO_3 , OH)

Bicarbonate, carbonate, or hydroxide is sometimes reported as alkalinity. The alkalinity of a water is produced by anions or molecular species of weak acids which

are not fully dissociated above a pH of 4.5. Since the major causes of alkalinity in most natural waters are carbonate and bicarbonate ions dissolved from carbonate rocks, the results are usually reported in terms of these constituents. Although alkalinity may suggest the presence of definite amounts of carbonate, bicarbonate or hydroxide, there are other ions that contribute to alkalinity such as silicates, phosphates, borates, possibly fluoride, and certain organic anions which may occur in colored waters. The significance of alkalinity to the domestic, agricultural, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, K) associated with it. Alkalinity in moderate amounts does not adversely affect most users.

Hydroxide may occur in water that has been softened by the lime process. Its presence in streams usually can be taken as an indication of contamination and does not represent the natural chemical character of the water.

Sulfide (S)

Sulfide occurs in water as a result of bacterial and chemical processes. It usually is present as hydrogen sulfide. Variable amounts may be found in waters receiving sewage and (or) industrial wastes, such as from tanneries, papermills, chemical plants, and gas manufacturing work (California State Water Quality Control Board, 1963).

Waters containing sulfides, especially hydrogen sulfide, may be considered undesirable because of their odor. The U.S. Public Health Service (1962) states that water on carriers subject to Federal quarantine regulations shall have no objectionable taste or odor. The toxicity to aquatic organisms differs significantly with the species and the nature of associated ions.

Sulfate (SO₄)

Sulfate is dissolved from most sedimentary rocks. Large quantities may be derived from beds of gypsum, sodium sulfate deposits, and some types of shale. Organic material containing sulfur adds sulfate to the water as a phase of the sulfur cycle. In natural waters, concentrations range from a few mg/l to several thousand mg/l.

The U.S. Public Health Service (1962) recommends that the sulfate concentration not exceed 250 mg/l in drinking and culinary water on carriers subject to Federal quarantine regulations.

Sulfates are less toxic to crops than chlorides.

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride, whereas streams in arid or semiarid regions may contain several hundred mg/l of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands or are affected by ground-water-inflow carrying appreciable quantities of chloride. Large quantities of chloride in water that contains a high content of calcium and magnesium increases the water's corrosiveness. The presence of abnormal concentrations of chloride and nitrogenous material together in water supplies indicates possible pollution by human or animal wastes.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Investigations have proved that fluoride concentrations of about 0.6 to 1.7 mg/l reduced the incidence of dental caries and that concentrations greater than 1.7 mg/l also protect the teeth from cavities but cause an undesirable black stain (Durfor and Becker, 1964, p. 20). Public Health Service, 1962, states, "When fluoride is naturally present in drinking water, the concentration should not average more than the appropriate upper control limit (0.6 to 1.7 mg/l). Presence of fluoride in average concentration greater than two times the optimum values shall constitute grounds for rejection of the supply." Concentration higher than the stated limits may cause mottled enamel in teeth, endemic cumulative fluorosis, and skeletal effects.

Bromide (Br)

Bromine is a very minor element in the earth's crust and is normally present in surface waters in only minute quantities. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. It resembles chloride in that it tends to be concentrated in sea water.

Iodide (I)

Iodide is considerably less abundant both in rocks and water than bromine. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. It occurs in sea water to the extent of less than 1 mg/l. Rankama and Sahama (1950) report iodide present in rainwater to the extent of 0.001 to 0.003 mg/l and in river water in about the same amount. Few waters will contain over 2.0 mg/l.

Nitrogen, organic (N)

Organic nitrogen includes all nitrogenous organic compounds, such as amino acid, polypeptides, and proteins. It is present naturally in all surface waters as the result of inflow of nitrogenous products from the watershed and the normal biological life of the stream.

Organic nitrogen is not pathologically significant but is sometimes an indication of pollution.

Nitrogen, ammonia (NH₄, as N)

Ammonia nitrogen includes nitrogen in the forms of NH₃ and NH₄⁺¹. As a component of the nitrogen cycle, it is often present in water, but usually in only small amounts. More than 0.1 mg/l usually indicates organic pollution (Rudolph, 1931).

There is no evidence that ammonia nitrogen in water is physiologically significant to man or livestock. Fish, however, cannot tolerate large quantities.

Nitrite (NO₂)

Nitrite is unstable in the presence of oxygen and is, therefore, absent or present in only minute quantities in most natural waters under aerobic condition. The presence of nitrite in water is sometimes an indication of organic pollution.

Recommended tolerances of nitrite in domestic water supplies differ widely. A generally accepted limit is 2 mg/l, but as little as 0.1 mg/l has been proposed (California State Water Quality Control Board, 1963).

Nitrate (NO₃)

Nitrate in water is considered a final oxidation product of nitrogenous material and may indicate contamination by sewage or other organic matter, such as agricultural runoff, or industrial waste. The quantities of nitrate present in surface waters are generally less than 5 mg/l (as NO₃) and have no effect on the value of the water for ordinary uses.

It has been reported that as much as 2 mg/l of nitrate in boiler water tends to decrease intercrystalline cracking of boiler steel. Studies made by Faucett and Miller (1946), Waring (1949) and by the National Research Council (Maxcy, 1950) concluded that drinking water containing nitrates in excess of 44 mg/l (as NO₃) should be regarded as unsafe for infant feeding. U.S. Public Health Service (1962) sets 45 mg/l as the upper limit.

Phosphorus (P)

Phosphorus is an essential element in the growth of plants and animals. It occurs in water as organically bound phosphorus or as phosphate (PO₄). Some sources that contribute nitrate, such as organic wastes are also important sources of phosphorus. The addition of phosphates in water treatment constitutes a possible source although the dosage is usually small. In some areas phosphate fertilizers may yield some phosphorus to water. Another important source is the use of phosphates in detergents.

Domestic and industrial sewage effluents often contain considerable amounts of phosphorus. Concentrations of phosphorus found in water are not reported to be toxic to man, animal, or fish. However, the element can stimulate the growth of algae, which may cause taste and odor problems in public water treatment and esthetic problems in recreation areas.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 mg/l boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions of the Southwest and West where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 mg/l of dissolved solids are usually satisfactory for domestic and some industrial uses. Water containing several thousand mg/l of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands, but generally water containing more than about 2,000 mg/l is considered to be unsuitable for long-term irrigation under average conditions.

Arsenic (As)

Arsenic compounds are present naturally in some waters, but the occurrence of quantities detrimental to health is rare. Weed killers, insecticides and many industrial effluents contain arsenic and are potential sources of water pollution. The U.S. Public Health Service (1962) states that the concentration of arsenic in drinking water on carriers subject to Federal quarantine regulations should not exceed 0.01 mg/l and concentrations in excess of 0.05 mg/l are grounds for rejection of the supply. Concentrations of 2-4 mg of arsenic per liter are reported not to interfere with the self-purification of streams (Rudolfs and others, 1944) but concentrations in excess of 15 mg/l may be harmful to some fish.

Barium (Ba)

Barium may replace potassium in some of the igneous rock minerals, especially feldspar, and barium sulfate (barite) is a common barium mineral of secondary origin. Only traces of barium are present in surface water and sea water. Because natural water contains sulfate, barium will dissolve only in trace amounts. Barium sometimes occurs in brines from oil-well wastes.

The U.S. Public Health Service (1962) states that water containing concentrations of barium in excess of 1.0 mg/l is not suitable for drinking and culinary use because of the serious toxic effects of barium on heart, blood vessels, and nerves.

Cadmium (Cd)

This element is found in nature largely in the form of the sulfide, and as an impurity in zinc-lead ores. The carbonate and hydroxide are not very soluble in water and will precipitate at high pH values; the chloride, nitrate, and sulfate are soluble and remain in solution under most pH conditions.

The extensive use of the element and its salts in metallurgy, electroplating, ceramics, and photography make it a frequent component of industrial wastes.

The U.S. Public Health Service (1962) established as grounds for rejection any water containing more than 0.01 mg/l of cadmium.

Chromium (Cr)

Few if any waters contain chromium from natural sources. Natural waters can probably contain only traces of chromium as a cation unless the pH is very low. When

chromium is present in water, it is usually the result of pollution by industrial wastes. Concentrations of more than 0.05 mg/l of chromium in the hexavalent form constitute grounds for rejection of a water for domestic use on the basis of the standards of the U.S. Public Health Service (1962).

Cobalt (Co)

Cobalt occurs in nature in the minerals smaltite, $(\text{Co},\text{Ni})\text{As}_2$, and cobaltite, CoAsS . Alluvial deposits and soils derived from shales often contain cobalt in the form of phosphate or sulfate, but other soil types may be markedly deficient in cobalt in any form (Bear, 1955). Ruminant animals may be adversely affected by grazing on land deficient in cobalt.

For domestic water supplies, no maximum safe concentration has been established.

Copper (Cu)

Copper is a fairly common trace constituent of natural water. Small amounts may be introduced into water by solution of copper and brass water pipes and other copper-bearing equipment in contact with the water, or from copper salts added to control algae in open reservoirs. Copper salts such as the sulfate and chloride are highly soluble in waters with a low pH but in water of normal alkalinity the salts hydrolyze and the copper may be precipitated. In the normal pH range of natural water containing carbon dioxide, the copper might be precipitated as carbonate. The oxidized portions of sulfide-copper ore bodies contain other copper compounds. The presence of copper in mine water is common.

Copper imparts a disagreeable metallic taste to water. As little as 1.5 mg/l can usually be detected, and 5 mg/l can render the water unpalatable. Copper is not considered to be a cumulative systemic poison like lead and mercury; most copper ingested is excreted by the body and very little is retained. The pathological effects of copper are controversial, but it is generally believed very unlikely that humans could unknowingly ingest toxic quantities from palatable drinking water. The U.S. Public Health Service (1962) recommends that copper should not exceed 1.0 mg/l in drinking and culinary water.

Lead (Pb)

Lead seldom occurs in most natural waters, but industrial mine and smelter effluents may contain relatively large amounts of lead which contaminates the streams. Also, atmospheric contamination which is produced from several types of engine exhausts has considerably increased the availability of this element for solution in rainfall, resulting in contamination of lead in streams (Hem, 1970).

Lead in the form of sulfate is reported to be soluble in water to the extent of 31 mg/l (Seidell, 1940) at 25°C. In natural water this concentration would not be approached, however, since a pH of less than 4.5 would probably be required to prevent formation of lead hydroxide and carbonate. It is reported (Pleissner, 1907) that at 18°C water free of carbon dioxide will dissolve the equivalent of 1.4 mg/l of lead and the solubility is increased nearly four fold by the presence of 2.8 mg/l of carbon dioxide in the solution. Presence of other ions may increase the solubility of lead. Reports on human tolerance of lead vary widely, but the U.S. Public Health Service (1962) states that lead shall not exceed 0.05 mg/l in drinking and culinary water on carriers subject to Federal quarantine regulations.

Lithium (Li)

Lithium is present in some minerals but is not abundant in nature. From available information, most fresh waters rarely contain lithium of concentrations exceeding 10 mg/l, but larger quantities may be present in brines and thermal waters. Lithium is used in metallurgy, medicinal water, and some types of glass and storage batteries. Waste from such industries may contain lithium.

Mercury (Hg)

Mercury is the only common metal which is liquid at ordinary temperatures. It occurs free in nature but its chief source is cinnabar (HgS). Mercury compounds are virulent culminative poisons which are readily absorbed through the respiratory and gastrointestinal tracts or through unbroken skin (Weast and Selby, 1967).

The main source of high concentrations of dissolved mercury in water, in the form of highly toxic methyl mercury, $\text{Hg}(\text{CH}_3)_2$, comes from waste discharges from industrial users of mercury and from mercurial pesticides.

Fish from streams and lakes subject to mercury contamination have been found to contain amounts of mercury above the safe limits for food consumption. The U.S. Public Health Service has proposed that the upper limits of dissolved mercury in water for domestic use should not exceed 5 micrograms per liter (0.005 mg/l).

Nickel (Ni)

Elemental nickel seldom occurs in nature, but its compounds are found in many ores and minerals. Many nickel salts are quite soluble and may contribute to water pollution, especially when discharged from metal-plating industries.

The U.S. Public Health Service (1962) has not placed a limit on nickel concentration in public water supplies.

Strontium (Sr)

Strontium is a typical alkaline-earth element and is similar chemically to calcium. Strontium may be present in natural water in amounts up to a few mg/l much more frequently than the available data indicate. In most surface water the amount of strontium is small in proportion to calcium. However, in sea water the ratio of strontium to calcium is 1:30.

Zinc (Zn)

Zinc is abundant in rocks and ores but is only a minor constituent in natural water because the free metal and its oxides are only sparingly soluble. In most alkaline surface waters it is present only in trace quantities, but more may be present in acid water. Chlorides and sulfates of zinc are highly soluble. Zinc is used in many commercial products, and industrial wastes may contain large amounts.

Zinc in water does not cause serious effects on health, but produces undesirable esthetic effects. The U.S. Public Health Service (1962, p. 55) recommends that the zinc content not exceed 5 mg/l in drinking and culinary water.

PROPERTIES AND CHARACTERISTICS OF WATER

Dissolved solids

Theoretically, dissolved solids are anhydrous residues of the dissolved substances in water.

All solutes affect the chemical and physical properties of the water and result in an osmotic pressure. Water with several thousand mg/l of dissolved solids is generally not palatable, although those accustomed to highly mineralized water may complain that less concentrated water tastes flat. The U.S. Public Health Service (1962) recommends that the maximum concentration of dissolved solids not exceed 500 mg/l in drinking and culinary water on carriers subject to Federal quarantine regulations, but permits 1,000 mg/l if no better water is available. Reported livestock tolerances range from 3,000 mg/l (Colorado Agricultural Experiment Station, 1943) to 15,000 mg/l (Heller, 1933).

Industrial tolerances for dissolved solids differ widely, but few industrial processes will permit more than 1,000 mg/l. The Geological Survey classifies the degree of salinity of these more mineralized bodies of water as follows (Swenson and Baldwin, 1965):

Dissolved solids (mg/l)	Degree of salinity
Less than 1,000	Nonsaline.
1,000 to 3,000	Slightly saline.
3,000 to 10,000.	Moderately saline.
10,000 to 35,000	Very saline.

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is commonly recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and pipes, with the resultant decrease in rate of heat transfer, possibility of boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect.

Generally, bicarbonate and carbonate determine the proportions of "carbonate" hardness of water. Carbonate hardness is the amount of hardness chemically equivalent to the amount of bicarbonate and carbonate in solution. Carbonate hardness is approximately equal to the amount of hardness that is removed from water by boiling.

Noncarbonate hardness is the difference between the hardness calculated from the total amount of calcium and magnesium in solution and the carbonate hardness. The scale formed at high temperatures by the evaporation of water containing non-carbonate hardness commonly is tough, heat resistant, and difficult to remove.

Although many people talk about soft water and hard water, there has been no firm line of demarcation. Water that seems hard to an easterner may seem soft to a westerner. In this report hardness of water is classified as follows:

Hardness range (calcium carbonate in mg/l)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
More than 180	Very hard

Durfur and Becker, 1964, p. 23-27.

Acidity (H^{+1})

The use of the terms acidity and alkalinity is widespread in the literature of water analysis and is a cause of confusion to those who are more accustomed to seeing a pH of 7.0 used as a neutral point. Acidity of a natural water represents the content of free carbon dioxide and other uncombined gases, organic acids and salts of strong acids and weak bases that hydrolyze to give hydrogen ions. Sulfates of iron and aluminum in mine and industrial wastes are common sources of acidity.

Sodium adsorption ratio (SAR)

The term "sodium adsorption ratio (SAR)" was introduced by the U.S. Salinity Laboratory Staff (1954). It is a ratio expressing the relative activity of sodium ions in exchange reaction with soil and is an index of the sodium or alkali hazard to the soil. Sodium adsorption ratio is expressed by the equation:

$$SAR = \frac{Na^{+}}{\frac{Ca^{++} + Mg^{++}}{2}}$$

where the concentrations of the ions are expressed in milliequivalents per liter.

Waters are divided into four classes with respect to sodium or alkali hazard: low, medium, high, and very high, depending upon the SAR and the specific conductance. At a conductance of 100 micromhos per centimeter the dividing points are at SAR values of 10, 18, and 26, but at 5,000 micromhos the corresponding dividing points are SAR values of approximately 2.5, 6.5, and 11. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Specific conductance (micromhos per centimeter at 25°C)

Specific conductance is a convenient, rapid determination used to estimate the amount of dissolved solids in water. It is a measure of the ability of water to transmit a small electrical current (see p. 6). The more dissolved solids in water that can transmit electricity the greater the specific conductance of the water. Commonly, the amount of dissolved solids (in 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 (Durfor and Becker, 1964 p. 27-29).

Specific conductance of most waters in the eastern United States is less than 1,000 micromhos, but in the arid western parts of the country, a specific conductance of more than 1,000 micromhos is common.

Hydrogen-ion concentration (pH)

Hydrogen-ion concentration is expressed in terms of pH units (see p. 6). The values of pH often are used as a measure of the solvent power of water or as an indicator of the chemical behavior certain solutions may have toward rock minerals.

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. 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. Some alkaline surface waters have pH values greater than 8.0 and waters containing free mineral acid or organic matter usually have pH values less than 4.5.

The investigator who utilizes pH data in his interpretations of water analyses should be careful to place pH values in their proper perspective.

Temperature

Temperature is an important factor in properly determining the quality of water. This is very evident for such a direct use as an industrial coolant. Temperature is also important, but perhaps not so evident, for its indirect influence upon aquatic biota, concentrations of dissolved gases, and distribution of chemical solutes in lakes and reservoirs as a consequence of thermal stratification and variation.

Surface water temperatures tend to change seasonally and daily with air temperatures, except for the outflow of large springs. Superimposed upon the annual temperature cycle is a daily fluctuation of temperature which is greater in warm seasons than in cold and greater in sunny periods than with a cloud cover. Natural warming is due mainly to absorption of a solar radiation by the water and secondarily to transfer of heat from the air. Condensation of water vapor at the water surface is reported to furnish measurable quantities of heat. Heat loss takes place largely through radiation, with further losses through evaporation and conduction to the air and to the streambed. Thus the temperature of a small stream generally reaches a maximum in mid- to late afternoon due to solar heating and reaches a minimum from early to mid-morning after nocturnal radiation.

Color

In water analysis the term "color" refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. In some areas objectionable color in water results from industrial wastes and sewage. Clear deep water may appear blue as the result of a scattering of sunlight by the water molecules. Water for domestic use and some industrial uses should be free from any perceptible color. A color less than 15 units generally passes unnoticed (U.S. Public Health Service, 1962). Some swamp waters have natural color in excess of 300 units.

The extent to which a water is colored by material in solution is commonly reported as a part of a water analysis because a significant color in water may indicate the presence of organic material that may have some bearing on the dissolved solids content. Color in water is expressed in terms of units between 0 and 500 or more based on the above standard (see p. 6).

Turbidity

Turbidity is the optical property of a suspension with reference to the extent to which the penetration of light is inhibited by the presence of insoluble material. Turbidity is a function of both the concentration and particle size of the suspended material. It is reported in terms of mg/l of silica or Jackson turbidity units (JTU).

Turbid water is abrasive in pipes, pumps, and turbine blades. Although turbidity does not directly measure the safety of drinking water, it is related to the consumer's acceptance of the water. A level of 5 JTU of turbidity becomes objectionable to a considerable number of people (U.S. Public Health, 1962).

Density at 20° C

Density is the mass of any substance per unit volume at a designated standard temperature. Density should not be confused with specific gravity, which is a mass-to-mass relation.

The density value has some use in industries that utilize brines and whose basic unit of concentration of dissolved material is density. Density is used primarily by the chemist in the computation of milligrams per liter for highly mineralized waters.

Dissolved oxygen (DO)

Oxygen dissolved in water is derived from the air and from the oxygen given off in the process of photosynthesis by aquatic plants.

Dissolved oxygen in water has no adverse physiological effect and actually increases the palatability of the water. No minimum concentration of dissolved oxygen required to support fish life has been listed because the oxygen requirements of fish vary with the species and age, with temperature, and with concentration of other substances in the water.

Dissolved oxygen is responsible for many of the corrosion problems in industry.

Chemical Oxygen demand (COD)

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

Biochemical oxygen demand (BOD)

Biochemical oxygen demand is a measure of the oxygen required to oxidize the organic material usable as a source of food by aerobic organisms.

Biological and microbiological information

Biological and microbiological information is an important aspect in the evaluation of water quality. The kinds and amount of aquatic biota in a stream or lake can be useful "indicators" of environmental conditions and particularly of the degree of pollution of water with organic wastes (Doudoroff and Warren, 1957). Biological information includes qualitative and quantitative analyses of plankton, bottom organisms, and particulate inorganic and amorphous matter present. Microbiological information includes quantitative identification of certain bacteriological indicator organisms.

Chlorophyll (plant pigment).--The concentrations of photosynthetic pigments in natural waters vary with time and changing aquatic conditions. Concentrations of chlorophyll *a*, *b*, and *c* (spectrophotometric determination) are used to estimate the biomass and photosynthetic capacity of phytoplankton (blue-green algae). Ratios between the different forms of chlorophyll are thought to indicate the taxonomic composition or the physiological state of the algae community (Slack, 1970).

Plankton.--Plankton is the floating (or weakly swimming) animal or plant life in a body of water consisting, chiefly of minute plants (as diatoms and blue-green algae) and of minute animals (as protozoan, entomostracans and various larvae). Algae are known to cause tastes and odor in water supply.

Plankton population in water is obtained by count level (the number of organisms per milliliter).

Coliform bacteria.--Coliform organisms have long been used as indicators of sewage pollution, although the group includes bacteria from diverse natural sources and habitats. For example, members of the coliform group are indigenous to soil and vegetation as well as feces. Standards for drinking-water quality provide definite minimums as to number of samples examined and the maximum number of coliform organisms allowable per 100 milliliters (ml) of finished water (Slack, 1970). The coliform population of water is determined either by the most probable number (MPN), or by the incubation membrane filter method, a direct count of coliform colonies per plate.

Fecal coliform bacteria.--Fecal coliform is that portion of the coliform group that is present in the intestinal tract of warm-blooded animals and is capable of producing gas from lactose in suitable culture medium at 44.5°C. Organisms from other sources generally cannot produce gas in this manner. (American Public Health Assoc. and others, 1965). Thus, in general, the presence of fecal coliform organisms indicates recent pollution (Slack, 1970).

Organics

Phenols.--Phenolic material in water resources is invariably the result of pollution. Phenols are widely used as disinfectants and in the synthesis of many organic compounds. Waste products from oil refineries, coke areas, and chemical plants may contain high concentrations. Fortunately, phenols decompose in the presence of oxygen and microorganisms, and their persistence downstream from point of entry is relatively short lived. The rate of decomposition is dependent on the environment.

Very low concentrations impart such a disagreeable taste to water that it is highly improbable that harmful amounts could be consumed unknowingly. Reported thresholds of detection of taste and odor range from 0.001 to 0.01 mg/l.

Cyanide (CN).--Cyanides are not found free in nature, but may become contaminants of water supplies by means of effluents from gasworks, coke ovens, steel mills, electroplating processes, and chemical industries. In natural streams and organic soils, simple cyanides are decomposed by bacterial action, whereas the metal-cyanide complexes are often quite stable and more resistant to degradation. The U.S. Public Health Service (1962) set a recommended limit of 0.01 mg cyanide per liter and a mandatory limit of 0.2 mg/l for waters subject to interstate regulations.

Detergents (methylene blue active substance, MBAS).--Anionic surfactants in detergents resist chemical oxidation and biological breakdown. Soap is an example of this class and the synthetic members are sodium salts of organic sulfonates or sulfates (Rose, 1966). Their persistence in water over long periods of time contributes to pollution of both ground water and surface water. Some of the effects produced from detergent pollution are unpleasant taste, odor, and foaming (Wayman, and others, 1962). Although the physiological implications of MBAS to human beings is unknown, prolonged ingestion of this material by rats is believed to be nontoxic (Paynter, 1960). The U.S. Public Health Service (1962) recommends that MBAS should not exceed 0.5 mg/l in drinking and culinary waters.

Total Organic Carbon (TOC).--Total organic carbon is a measure of the organically related carbonaceous content of water. It includes all natural and manmade organic compounds which are combustible at a temperature of 950°C.

Sediment

Fluvial sediment generally is regarded as that material which is transported by, suspended in, or deposited by water. Suspended sediment is that part which remains in suspension in water owing to the upward components of turbulent currents or by

colloidal suspension. Much fluvial sediment results from the natural process of erosion, which in turn is part of the geologic cycle of rock transformation. This natural process may be accelerated by agricultural practices. Sediment also is contributed by a number of industrial and construction activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended material.

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, character of the solid mantle, plant cover, topography, and land use. The mode and rate of sediment erosion, transport, and deposition is determined largely by the size distribution of the particles or more precisely by the fall velocities of the particles in water. Sediment particles in the sand size range (larger than 0.062 mm) do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. In contrast, the sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable characteristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

STREAMFLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in the Geological Survey water-supply paper series, "Surface Water Supply of the United States, 1966-70." The discharge reported for a composite sample is usually the average of daily mean discharges for the composite period. The discharges reported in the tables of single analyses are either daily mean discharges or discharges obtained at the time samples were collected and computed from a stage-discharge relation or from a discharge measurement.

PUBLICATIONS

Reports giving records of chemical quality and temperatures of surface waters and suspended-sediment loads of streams in the area covered by this volume for the water years 1941-68, are listed below:

Numbers of water-supply papers containing records for Part 4 and 5, 1941-68

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1951	b1198	1957	b1521	1963	b1949
1942	950	1952	a1250	1958	a1571	1964	a1955
1943	970		b1251		b1572		b1956
1944	1022	1953	a1290	1959	a1642	1965	a1962
1945	1030		b1291		b1643		b1963
1946	1050	1954	a1350	1960	a1742	1966	a1992
1947	1102		b1351		b1743		b1993
1948	1132	1955	a1400	1961	a1882	1967	a2012
1949	1162		b1401		b1883		b2013
1950	a1186	1956	a1450	1962	a1942	1968	2094
	b1187		b1451		b1943		
1951	a1197	1957	a1520	1963	a1948		

a Part 4. b Part 5.

Geological Survey reports containing chemical quality, temperature, and sediment data obtained before 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

- *135. Composition of river and lake waters of the United States, 1924.

BULLETINS

- *479. The geochemical interpretation of water analyses, 1911.
770. The data of geochemistry, 1924.

WATER-SUPPLY PAPERS

- *108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.
*161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
*193. The quality of surface waters in Minnesota, 1907.
*236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.
*237. The quality of the surface waters of California, 1910.
*239. The quality of surface waters of Illinois, 1910.
*273. Quality of the water supplies of Kansas, with a preliminary report on stream pollution by mine waters in southeastern Kansas, 1911.
*274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
*339. Quality of the surface waters of Washington, 1914.
*363. Quality of the surface waters of Oregon, 1914.
*418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
*596-B. Quality of water of Colorado River in 1925-26, 1928.
*596-D. Quality of water of Pecos River in Texas, 1928.
*596-E. Quality of the surface waters of New Jersey, 1928.
*636-A. Quality of water of the Colorado River in 1926-28, 1930.
*636-B. Suspended matter in the Colorado River in 1925-28, 1930.
*638-D. Quality of water of the Colorado River in 1928-30, 1932.
*839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
*889-E. Chemical character of surface water of Georgia, 1944.
*998. Suspended sediment in the Colorado River, 1925-41, 1947.
1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, who will, upon request, furnish lists giving prices.

COOPERATION

The records given in this report were obtained through the cooperation and support of numerous agencies--Federal, State, and local. Some of the records for the Red River of the North in North Dakota were obtained as the result of investigations made as part of a program of the United States Department of the Interior for development

of the Missouri River Basin at the request of the Bureau of Reclamation and other Federal agencies with funds provided directly to the U.S. Geological Survey.

State and local agencies shared with the U.S. Geological Survey in planning and financing some of the investigations and, in some instances provided technical assistance in sample collection and laboratory analysis. The State, local, and Federal agencies that cooperated in these quality-of-water investigations are as follows:

Illinois--Illinois Department of Public Works and Buildings, Norbert Johnson, director, through the Division of Waterways, J. C. Guillou, chief of waterway engineer.

Indiana--Indiana Department of Natural Resources, F. P. Provost, director, through Bureau of Water and Mineral Resources, W. J. Andrews, deputy director; Indiana Board of Health, A. C. Offut, commissioner, and B. A. Pool, director, Bureau of Environmental Sanitation; Indiana State Highway Commission, R. W. Steele, chairman, R. H. Harrell, executive director, and F. L. Ashbaucher, chief engineer.

Iowa--Iowa Geological Survey, H. G. Hershey, director and State geologist; Agriculture Experiment Station, Iowa State University; Soil Conservation Service, U.S. Department of Agriculture.

Michigan--Michigan Department of Natural Resources, R. A. McMullen, director, G. A. Walker, deputy director, through Water Resources Commission, R. W. Purdy, executive secretary, Geological Survey Division, G. E. Eddy, chief, Fish Division, W. H. Tody, chief, Parks Division, R. O. Dodge, chief, and Engineering Division, H. C. McSwain, chief; Michigan Department of State Highways, H. E. Hill, director.

Minnesota--Minnesota Department of Conservation, Division of Waters, Soils, and Minerals, E. R. Gere, director.

Missouri--Missouri Department of Public Health and Welfare, Water Pollution Board, J. K. Smith, executive secretary; Missouri Division of Geological Survey and Water Resources, Dr. W. C. Hayes, State geologist; Corps of Engineers, U.S. Army.

New York--New York State Department of Health, Environmental Health Service, D. F. Metzler, deputy commissioner; New York State Department of Conservation, Division of Water Resources, F. W. Montanari, assistant commissioner.

Ohio--Ohio Department of Natural Resources, F. E. Morr, director and C. V. Youngquist, chief, Division of Water; Ohio Department of Health, Dr. E. W. Arnold, director, and G. H. Eagle, chief engineer.

South Dakota--South Dakota Water Resources Commission, J. W. Grimes, chief engineer; East Dakota Conservancy Sub-district, V. W. Butler, manager-engineer.

Wisconsin--Wisconsin Department of Natural Resources, L. P. Voigt, secretary; University Extension, University of Wisconsin, Geological and Natural History Survey, G. F. Hanson, State geologist and director.

DIVISION OF WORK

The quality-of-water work was performed by the Water Resources Division of the Geological Survey, E. L. Hendricks, chief hydrologist, and under the direction of the district chiefs listed in the preface.

Correspondence regarding the records in this report or any additional information should be directed to the district chief of the appropriate Geological Survey-Water Resources Division district office as indicated in the following table.

State	District Office	Address
Illinois	Champaign 61820	P. O. Box 1026 605 N. Neil Street
Indiana	Indianapolis 46202	1819 N. Meridian St.

State	District Office	Address
Iowa	Iowa City 52240	1041 Arthur Street
Michigan	Okemos 48864	Red Cedar Research Park, 2400 Science Parkway
Minnesota	St. Paul 55101	1033 Post Office Bldg.
Missouri	Rolla 65401	103 West Tenth Street
Montana	Helena 59601	P. O. Box 1696 421 Federal Bldg. 316 N. Park Ave.
New York	Albany 12201	P. O. Box 948 Room 343, U.S. Post Office and Court House
North Dakota	Bismarck 58501	P. O. Box 778, Room 348 New Federal Bldg. 3rd St. and Rosser Ave.
Ohio	Columbus 43212	975 West Third Avenue
South Dakota	Huron 57350	P. O. Box 1412 Room 231, Federal Bldg.
Vermont	Boston, Mass. 02203	Room 2300, John F. Kennedy Federal Bldg.
Wisconsin	Madison 53706	Room 200 1815 University Ave.

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WATER-QUALITY STATIONS IN DOWNSTREAM ORDER

PART 4. ST. LAWRENCE RIVER BASIN

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MICH.
(Hydrologic bench-mark station)

LOCATION.--Lat 47°55'23", long 89°08'42" (revised), in NW¼ sec.28, T.64 N., R.38 W., Keweenaw County, temperature recorder at gaging station on left bank, 0.8 mile northeast of Windigo, and 35 miles southwest of Rock Harbor, Isle Royale National Park.

DRAINAGE AREA.--13.2 sq mi.

PERIOD OF RECORD.--Chemical analyses: February to September 1967 (miscellaneous), October 1967 to September 1968 (monthly).

Water temperatures: October 1964 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 19.0°C July 18, 19, Aug. 6, 7; minimum, freezing point on many days during November to March.

Period of record:

Water temperatures: Maximum, 19.5°C July 1, 1966, July 22, 23, 1967, July 18, 19, Aug. 6, 7, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--Intermittent periods of ice effect during winter months. Recorder stopped Mar. 14 to May 9; range in temperature, 0.0°C to 10.0°C.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO ₂)	IRON (FE)	MAN-GANESF (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO ₄ -TAS-SIUM (K)	BICAR-BONATE (HCO ₃)	CAR-BONATE (CO ₃)
OCT.												
17...	1015	3.2	6	--	--	--	19	7.4	3.6	1.2	88	0
17...	1030	--	6	12	.06	.00	--	--	--	--	--	--
FEB.												
13...	1230	--	0	16	.30	--	26	7.5	5.2	.6	110	0
13...	1300	1.3	0	--	--	--	--	--	--	--	--	--
MAY												
10...	1000	--	6	7.2	.20	.02	11	2.8	1.9	.5	39	0
10...	1000	22	6	--	--	--	--	--	--	--	--	--
JUNE												
13...	0900	--	13	7.4	.20	.00	10	3.5	1.7	.3	40	0
13...	0910	--	11	--	--	--	--	--	--	--	--	--
JULY												
10...	1000	7.5	12	8.8	--	--	18	3.6	2.4	.3	64	0
10...	1030	--	12	--	--	--	--	--	--	--	--	--
AUG.												
04...	1205	7.7	15	11	--	--	21	4.4	2.5	.5	74	0
13...	1430	6.1	16	--	--	--	--	--	--	--	--	--
13...	2035	5.6	15	--	--	--	--	--	--	--	--	--
18...	1700	11	13	16	--	--	20	4.2	3.0	.4	77	0
25...	1235	21	14	12	.88	.04	16	4.3	2.1	.4	62	0
SEPT.												
18...	1830	14	18	12	1.0	.03	16	5.1	2.4	.6	68	0
28...	1115	7.1	8	14	.95	.03	19	5.8	2.7	.6	81	0
DATE	SULFATE (SO ₄)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO ₃)	OIL-SOLVED SOLIDS (RESIDUE AT 180 C)	ALKALINITY AS CaCO ₃	HARDNESS (Ca, Mg)	NON-CAR-BONATE HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	COLOR	
OCT.												
17...	--	--	--	--	--	--	--	170	7.5	--		
17...	4.8	4.0	.2	.5	115	72	78	6	159	7.5	40	
FEB.												
13...	8.0	7.0	.1	.8	144	90	96	6	202	7.5	30	
13...	--	--	--	--	--	--	--	200	7.4	--		
MAY												
10...	8.0	1.0	.2	.8	59	32	39	7	82	7.1	60	
10...	--	--	--	--	--	--	--	90	7.5	--		
JUNE												
13...	7.2	1.0	.3	1.2	60	33	40	6	78	7.2	120	
13...	--	--	--	--	--	--	--	79	7.3	--		
JULY												
10...	7.6	1.0	.2	.4	92	52	60	8	123	7.4	90	
10...	--	--	--	--	--	--	--	120	7.1	--		
AUG.												
04...	8.8	1.0	.3	1.0	115	61	70	10	131	7.4	100	
13...	--	--	--	--	--	--	--	150	7.4	--		
13...	--	--	--	--	--	--	--	--	--	--	--	
19...	8.0	1.0	.2	.6	154	63	67	4	136	7.1	130	
25...	8.4	.8	.2	.6	169	51	58	6	112	6.9	170	
SEPT.												
18...	6.4	1.0	.2	.6	146	56	61	6	122	7.2	170	
28...	7.2	1.0	.2	.5	132	66	72	5	143	7.1	150	
DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	DISSOLVED OXYGEN	PERCENT SATURATION	RID-CHEMICAL OXYGEN DEMAND	COLLIFORM (MPN)					
OCT.												
17...	1015	3.2	6	12.2	98	1.8	930					
17...	1030	--	6	--	--	--	--					
FEB.												
13...	1230	--	0	--	--	--	--					
13...	1300	1.3	0	9.8	67	1.2	75					
MAY												
10...	1000	--	6	--	--	--	--					
10...	1000	22	6	11.0	88	2.2	30					
JUNE												
13...	0900	--	13	--	--	--	--					
13...	0910	--	11	11.6	104	3.0	2300					
JULY												
10...	1000	7.5	12	--	--	--	--					
10...	1030	--	12	11.8	109	1.2	430					
AUG.												
04...	1205	7.7	15	--	--	--	--					
13...	1430	6.1	16	10.0	100	.4	--					
13...	2035	5.6	15	9.6	94	1.0	150					
18...	1700	11	13	--	--	--	--					
25...	1235	21	14	--	--	--	--					
SEPT.												
18...	1830	14	18	--	--	--	--					
28...	1115	7.1	8	--	--	--	--					

STREAMS TRIBUTARY TO LAKE MICHIGAN

04048000 BLACK RIVER NEAR GARNET, MICH.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	3.0	2.0	9.0	8.0	13.0	11.0	16.0	13.0	12.0	12.0	13.0	13.0
2	3.0	2.0	9.0	8.0	11.0	11.0	16.0	13.0	12.0	12.0	13.0	13.0
3	3.0	2.0	9.0	9.0	13.0	11.0	13.0	11.0	13.0	12.0	13.0	13.0
4	3.0	2.0	9.0	8.0	14.0	11.0	13.0	12.0	13.0	13.0	13.0	13.0
5	2.0	2.0	8.0	7.0	15.0	12.0	14.0	12.0	13.0	13.0	14.0	13.0
6	3.0	2.0	9.0	7.0	16.0	13.0	14.0	12.0	13.0	13.0	14.0	14.0
7	4.0	3.0	9.0	7.0	17.0	14.0	14.0	13.0	13.0	13.0	14.0	13.0
8	4.0	4.0	11.0	9.0	17.0	14.0	15.0	13.0	13.0	13.0	13.0	13.0
9	4.0	4.0	11.0	10.0	16.0	14.0	15.0	13.0	13.0	13.0	14.0	13.0
10	4.0	4.0	11.0	8.0	14.0	13.0	13.0	12.0	13.0	12.0	14.0	14.0
11	4.0	4.0	11.0	8.0	14.0	13.0	13.0	11.0	12.0	11.0	14.0	13.0
12	7.0	4.0	12.0	9.0	13.0	11.0	13.0	12.0	12.0	11.0	14.0	12.0
13	7.0	7.0	13.0	9.0	12.0	9.0	14.0	13.0	12.0	12.0	13.0	13.0
14	7.0	6.0	13.0	12.0	11.0	10.0	14.0	13.0	12.0	12.0	14.0	13.0
15	6.0	4.0	14.0	11.0	12.0	9.0	14.0	14.0	12.0	12.0	15.0	14.0
16	7.0	6.0	14.0	12.0	12.0	9.0	15.0	14.0	12.0	12.0	15.0	14.0
17	7.0	7.0	12.0	10.0	13.0	10.0	15.0	14.0	12.0	12.0	15.0	14.0
18	8.0	7.0	12.0	9.0	11.0	9.0	15.0	14.0	12.0	12.0	16.0	15.0
19	9.0	8.0	12.0	10.0	13.0	10.0	14.0	13.0	12.0	12.0	16.0	16.0
20	9.0	8.0	12.0	9.0	12.0	9.0	14.0	13.0	14.0	13.0	16.0	16.0
21	6.0	8.0	12.0	10.0	11.0	11.0	13.0	13.0	14.0	14.0	16.0	15.0
22	9.0	8.0	11.0	8.0	13.0	11.0	13.0	13.0	14.0	14.0	16.0	15.0
23	9.0	8.0	12.0	10.0	13.0	13.0	13.0	12.0	16.0	14.0	15.0	15.0
24	8.0	7.0	13.0	9.0	14.0	13.0	12.0	12.0	18.0	16.0	16.0	15.0
25	7.0	6.0	13.0	10.0	14.0	13.0	12.0	12.0	18.0	16.0	14.0	13.0
26	6.0	4.0	12.0	11.0	13.0	12.0	12.0	12.0	16.0	14.0	13.0	12.0
27	7.0	6.0	11.0	9.0	12.0	12.0	12.0	12.0	14.0	13.0	12.0	12.0
28	6.0	7.0	9.0	5.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.0
29	8.0	8.0	9.0	9.0	13.0	12.0	12.0	11.0	13.0	12.0	11.0	10.0
30	10.0	8.0	11.0	5.0	13.0	13.0	12.0	11.0	14.0	12.0	12.0	10.0
31	---	---	13.0	10.0	---	---	12.0	12.0	13.0	12.0	---	---
MONTH	10.0	2.0	14.0	7.0	17.0	9.0	16.0	11.0	18.0	11.0	16.0	10.0

04057900 BLACK RIVER NEAR REPUBLIC, MICH.

LOCATION.--Lat 46°25'08", long 87°53'21", in NE 1/4 sec.2, T.46 N., R.29 W., Marquette County, at gaging station on left bank, 5 ft downstream from bridge on county highway, 2.2 miles downstream from Bruce Creek, and 4.4 miles east of Republic.

DRAINAGE AREA.--34.4 sq mi.

PERIOD OF RECORD.--Chemical analyses: December 1966 to September 1968 (miscellaneous).
Water temperatures: October 1961 to September 1968 (discontinued).

EXTREMES.--1967-68:

Water temperatures: Maximum, 24.0°C July 16, 17; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 27.0°C July 1, 1963; minimum, freezing point on many days during winter periods.

REMARKS.--Complete ice cover during winter months. Recorder stopped July 18-25, range 18.0°C to 21.0°C; no record Aug. 15 to Sept. 30.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	TEMP-FRATHEF (DEG C)	SICAR-PICNATE (HCL3)	CAP-SUNATE (CO3)	SULFATE (SO4)	CHLO-RIDE (CL)	NITRATE (NO3)	HARD-NESS (CA+MG)	NON-CAR-COND-NESS	SPECI-FIC CONDU-CTANCE (MICRO-MHOS)	PH	COLOR	TUP-RID-ITY
OCT.														
30...	1410	--	4	12	0	16	7.0	2.8	57	25	15	66	6.9	--
JAN.														
11...	1615	7.82	1	62	0	31	7.0	8.4	144	91	30	185	7.3	200 4.3
APR.														
23...	1500	93.6	8	10	0	12	4.0	1.6	60	21	13	54	6.3	100 7.3

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057900 BLACK RIVER NEAR REPUBLIC, MICH.—Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	9.0	7.0	4.0	3.0	1.0	1.0	0	0	0	0	0	0
2	11.0	8.0	4.0	4.0	1.0	1.0	0	0	0	0	0	0
3	12.0	11.0	4.0	3.0	1.0	0	0	0	0	0	0	0
4	12.0	11.0	3.0	2.0	0	0	0	0	0	0	0	0
5	12.0	10.0	2.0	1.0	0	0	0	0	0	0	0	0
6	10.0	8.0	1.0	1.0	0	0	0	0	0	0	0	0
7	8.0	7.0	1.0	1.0	0	0	0	0	0	0	0	0
8	7.0	7.0	1.0	1.0	0	0	0	0	0	0	0	0
9	7.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
10	6.0	6.0	2.0	1.0	0	0	0	0	0	0	0	0
11	6.0	5.0	3.0	2.0	0	0	0	0	0	0	0	0
12	5.0	4.0	3.0	3.0	0	0	0	0	0	0	0	0
13	6.0	4.0	3.0	2.0	0	0	0	0	0	0	0	0
14	6.0	6.0	2.0	1.0	0	0	0	0	0	0	0	0
15	7.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
16	7.0	7.0	1.0	1.0	0	0	0	0	0	0	0	0
17	7.0	7.0	1.0	1.0	0	0	0	0	0	0	0	0
18	7.0	7.0	1.0	1.0	0	0	0	0	0	0	0	0
19	7.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
20	6.0	5.0	1.0	1.0	0	0	0	0	0	0	0	0
21	5.0	5.0	1.0	1.0	0	0	0	0	0	0	0	0
22	4.0	4.0	1.0	1.0	0	0	0	0	0	0	0	0
23	6.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
24	7.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
25	7.0	6.0	1.0	1.0	0	0	0	0	0	0	0	0
26	6.0	4.0	1.0	1.0	0	0	0	0	0	0	0	0
27	4.0	4.0	1.0	1.0	0	0	0	0	0	0	0	0
28	4.0	3.0	1.0	1.0	0	0	0	0	0	0	0	0
29	3.0	3.0	1.0	1.0	0	0	0	0	0	0	3.0	0
30	4.0	3.0	1.0	1.0	0	0	0	0	---	---	3.0	2.0
31	4.0	3.0	---	---	0	0	0	0	---	---	3.0	2.0
MCNTH	12.0	3.0	4.0	1.0	1.0	0	0	0	0	0	3.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	3.0	2.0	11.0	8.0	16.0	14.0	17.0	17.0	18.0	16.0	---	---
2	4.0	2.0	12.0	9.0	16.0	14.0	17.0	16.0	19.0	17.0	---	---
3	4.0	3.0	12.0	9.0	17.0	14.0	16.0	14.0	21.0	19.0	---	---
4	3.0	2.0	9.0	8.0	19.0	16.0	18.0	16.0	21.0	18.0	---	---
5	2.0	2.0	8.0	6.0	21.0	19.0	18.0	17.0	21.0	19.0	---	---
6	4.0	2.0	8.0	7.0	21.0	19.0	19.0	17.0	21.0	18.0	---	---
7	6.0	4.0	8.0	7.0	20.0	18.0	21.0	19.0	23.0	20.0	---	---
8	6.0	5.0	11.0	8.0	21.0	18.0	22.0	20.0	22.0	21.0	---	---
9	6.0	4.0	11.0	10.0	21.0	21.0	21.0	17.0	21.0	18.0	---	---
10	6.0	4.0	11.0	8.0	21.0	19.0	17.0	15.0	18.0	16.0	---	---
11	7.0	4.0	11.0	10.0	19.0	19.0	19.0	17.0	16.0	14.0	---	---
12	10.0	7.0	11.0	11.0	19.0	16.0	21.0	19.0	16.0	14.0	---	---
13	10.0	7.0	13.0	10.0	16.0	14.0	21.0	20.0	19.0	16.0	---	---
14	7.0	6.0	13.0	12.0	16.0	16.0	21.0	20.0	18.0	15.0	---	---
15	7.0	4.0	16.0	12.0	16.0	14.0	23.0	21.0	---	---	---	---
16	5.0	6.0	16.0	11.0	16.0	14.0	24.0	22.0	---	---	---	---
17	5.0	8.0	11.0	9.0	16.0	14.0	24.0	22.0	---	---	---	---
18	8.0	8.0	12.0	9.0	16.0	16.0	---	---	---	---	---	---
19	5.0	7.0	12.0	10.0	17.0	16.0	---	---	---	---	---	---
20	5.0	8.0	14.0	11.0	17.0	15.0	---	---	---	---	---	---
21	8.0	8.0	13.0	12.0	16.0	14.0	---	---	---	---	---	---
22	8.0	7.0	13.0	11.0	17.0	14.0	---	---	---	---	---	---
23	8.0	8.0	13.0	11.0	17.0	16.0	---	---	---	---	---	---
24	8.0	6.0	13.0	10.0	16.0	15.0	---	---	---	---	---	---
25	6.0	4.0	14.0	12.0	16.0	16.0	---	---	---	---	---	---
26	6.0	3.0	14.0	13.0	16.0	13.0	20.0	19.0	---	---	---	---
27	8.0	5.0	13.0	11.0	13.0	12.0	19.0	18.0	---	---	---	---
28	8.0	7.0	11.0	11.0	13.0	12.0	19.0	17.0	---	---	---	---
29	8.0	7.0	11.0	11.0	18.0	13.0	18.0	16.0	---	---	---	---
30	9.0	7.0	13.0	11.0	18.0	17.0	19.0	18.0	---	---	---	---
31	---	---	15.0	12.0	---	---	19.0	18.0	---	---	---	---
MCNTH	10.0	2.0	16.0	6.0	21.0	12.0	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE MICHIGAN

04082200 PESHEKEE RIVER NEAR CHAMPION, MICH.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968--CONTINUED
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
16	9.C	8.0	1.C	1.C	C	0	0	0	0	C	0	0
17	9.C	8.0	1.0	1.C	0	0	0	0	0	0	0	0
18	9.C	8.0	1.0	1.C	0	0	0	0	0	0	0	0
19	8.C	7.0	1.0	1.C	C	0	0	0	0	0	0	0
20	7.0	6.0	1.0	1.C	C	0	0	0	0	0	0	0
21	6.C	5.0	1.0	1.0	0	0	0	0	0	0	0	0
22	5.0	5.0	1.0	1.C	0	0	0	0	0	0	0	0
23	7.0	5.C	1.0	1.C	0	0	0	0	0	0	0	0
24	8.0	7.C	1.C	1.C	0	0	0	0	0	0	0	0
25	8.0	4.0	1.0	1.0	0	0	0	0	0	0	0	0
26	5.C	4.C	1.0	1.C	0	0	0	0	0	0	0	0
27	4.C	4.0	1.C	1.C	C	0	0	0	0	0	0	0
28	4.0	4.0	1.0	1.C	0	0	0	0	0	0	0	0
29	4.0	4.0	1.0	1.C	0	0	0	0	0	0	0	0
30	4.0	4.C	1.0	1.C	0	0	0	0	---	---	1.0	0
31	5.C	4.0	---	---	0	0	0	0	---	---	1.0	1.0
MCNTH	14.C	4.0	5.0	1.C	1.0	0	0	0	0	0	1.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	1.C	1.0	11.C	8.C	14.0	13.0	17.0	16.0	18.0	16.0	17.0	15.0
2	2.0	1.0	12.0	10.C	14.0	14.0	16.0	15.0	19.0	17.0	15.0	14.0
3	2.0	2.0	11.0	9.0	15.0	13.0	15.0	14.0	20.0	18.0	16.0	14.0
4	2.C	1.C	9.C	8.C	16.0	14.0	17.0	15.0	21.0	18.0	17.0	16.0
5	1.0	1.0	10.0	7.C	18.0	17.0	17.0	16.0	21.0	19.0	17.0	15.0
6	2.0	1.0	10.C	8.C	17.0	16.0	17.0	16.0	22.0	19.0	16.0	14.0
7	4.0	2.0	9.C	8.C	17.0	16.0	19.0	17.0	23.0	20.0	14.0	12.0
8	4.0	4.0	11.C	8.C	16.0	15.0	20.0	18.0	23.0	21.0	12.0	12.0
9	4.C	3.C	11.0	10.C	18.0	17.0	20.0	18.0	22.0	20.0	13.0	12.0
10	4.0	3.0	12.0	9.C	18.0	17.0	13.0	15.0	20.0	17.0	13.0	13.0
11	5.C	3.0	12.0	10.C	17.C	17.0	19.0	17.0	19.0	16.0	13.0	12.0
12	7.C	5.0	12.C	10.C	17.0	15.0	21.0	18.0	18.0	16.0	13.0	12.0
13	7.C	6.C	13.0	9.C	16.0	14.0	20.0	19.0	20.0	17.0	14.0	13.0
14	6.C	5.0	13.0	12.0	16.C	16.0	20.0	19.0	19.0	16.0	15.0	14.0
15	5.C	4.0	15.0	12.C	16.0	14.0	22.0	20.0	19.0	15.0	16.0	15.0
16	7.C	5.0	15.C	11.C	16.C	14.0	22.0	20.0	21.0	18.0	17.0	16.0
17	3.C	7.0	11.0	9.C	16.0	14.0	20.0	20.0	21.0	18.0	17.0	16.0
18	3.C	8.0	11.0	9.C	16.0	15.0	20.0	19.0	19.0	17.0	---	---
19	9.C	7.0	11.0	9.C	16.C	11.0	19.0	19.0	21.0	14.0	---	---
20	9.C	8.0	12.C	10.C	16.C	14.0	20.0	19.0	22.0	18.0	---	---
21	6.C	8.0	12.0	10.C	16.0	14.0	20.0	20.0	21.0	18.0	---	---
22	10.C	8.0	12.0	10.C	16.C	14.0	20.0	19.0	21.0	19.0	---	---
23	10.0	9.0	12.0	10.0	16.C	16.0	20.0	19.0	22.0	21.0	---	---
24	8.C	6.C	12.C	9.C	16.C	15.0	20.0	19.0	21.0	20.0	---	---
25	6.C	5.0	13.0	11.0	16.C	15.0	19.0	18.0	20.0	17.0	---	---
26	6.C	5.C	13.0	12.C	15.C	13.0	19.0	18.0	17.0	16.0	---	---
27	8.C	5.0	12.0	11.C	13.0	12.0	19.0	18.0	17.0	14.0	---	---
28	8.C	7.0	11.0	10.C	13.C	12.0	18.0	17.0	17.0	14.0	---	---
29	8.C	7.0	10.C	10.C	15.0	13.0	17.0	16.0	18.0	15.0	---	---
30	9.C	8.0	12.0	10.C	16.C	15.0	18.0	16.0	19.0	16.0	---	---
31	---	---	13.0	11.0	---	---	18.0	18.0	18.0	16.0	---	---
MCNTH	10.0	1.0	15.0	7.C	18.C	11.0	22.0	14.0	23.0	14.0	---	---

04082400 MICHIGANNE RIVER NEAR WITCH LAKE, MICH.

LOCATION.--Lat 46°14'48", long 86°00'45". in NW¼ sec.1, T.44 N., R.30 W., Marquette County, at gaging station 20 ft upstream from bridge on county highway, 0.4 mile upstream from Witch Lake Outlet, and 2.0 miles south of Witch Lake.

DRAINAGE AREA.--316 sq mi.

PERIOD OF RECORD.--Chemical analyses: December 1968 to September 1968 (miscellaneous).

Water temperatures: October 1964 to September 1968.

Sediment records: October 1964 to September 1968.

EXTREMES.--1967-68:

Sediment concentrations: Maximum daily, 80 mg/l May 29; minimum daily, 0 mg/l Aug. 14, 15.

Sediment loads: Maximum daily, 300 tons Sept. 10; minimum daily, 0 ton Aug. 14, 15.

Period of record:

Water temperatures (1964-67): Maximum, 23.5°C Aug. 14, 1965; minimum, freezing point on many days during winter periods.

Sediment concentrations: Maximum daily, 80 mg/l Apr. 23, June 5, 1966, May 29, 1968; minimum daily, 0 mg/l

Aug. 14, 15, 1968.

Sediment loads: Maximum daily, 434 tons Apr. 19, 1967; minimum daily, 0 tons Aug. 14, 15, 1968.

REMARKS.--Flow affected by ice Nov. 27 to Dec. 10, Dec. 13-16, Dec. 23 to Mar. 25. Occasional regulation caused by dam 14 miles above station.

CHEMICAL ANALYSYS IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	NITRATE (NO3)	DISSOLVED SOLIDS (PFSI-RIE AT 180 C)	HARDNESS (CA, MG)	NON-HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	COLD-BODY	TURBIDITY	
OCT. 30...	998	--	--	--	--	--	55	29	12	69	7.3	A	--	--
JAN. 11...	150	40	0	14	2.0	2.0	78	46	13	97	7.3	1	50	3.1
APR. 23...	1040	18	0	11	1.0	1.0	54	26	11	56	6.9	7	50	2.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04062400 MICHIGAN RIVER NEAR WITCH LAKE, MICH.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (ONCE-DAILY MEASUREMENT BETWEEN 0900 AND 1100)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.0	0	0	---	---	---	14.0	16.0	---	---
2	11.0	---	1.0	0	0	---	---	---	---	---	---	---
3	11.0	---	0	0	0	---	2.0	---	14.0	14.0	---	---
4	11.0	---	1.0	0	0	---	---	---	---	17.0	---	---
5	10.0	---	0	0	0	---	---	---	---	17.0	---	---
6	---	---	1.0	0	0	---	3.0	---	19.0	17.0	---	---
7	---	---	1.0	0	0	---	6.0	---	---	19.0	---	---
8	---	---	0	0	0	---	5.0	---	---	---	---	---
9	---	---	0	0	0	---	5.0	11.0	---	18.0	---	---
10	---	2.0	0	0	0	---	---	9.0	---	---	---	---
11	---	5.0	0	0	0	---	4.0	11.0	---	---	---	---
12	---	4.0	0	0	0	---	---	11.0	---	---	---	---
13	---	2.0	0	0	0	---	---	11.0	---	---	---	---
14	---	2.0	0	0	0	---	---	12.0	16.0	---	---	---
15	---	---	0	0	0	---	---	12.0	15.0	---	---	---
16	---	---	0	0	0	---	---	---	16.0	---	---	---
17	---	---	0	0	0	---	---	9.0	16.0	---	---	17.0
18	---	---	0	0	0	---	---	---	---	---	---	17.0
19	---	---	0	0	0	---	7.0	---	---	---	---	16.0
20	6.0	---	0	0	0	---	---	---	14.0	---	---	14.0
21	4.0	---	0	0	0	---	---	---	20.0	---	---	16.0
22	4.0	---	0	0	0	---	7.0	12.0	15.0	21.0	---	17.0
23	6.0	---	0	0	0	---	7.0	---	---	19.0	---	17.0
24	9.0	---	0	0	0	---	6.0	---	---	19.0	23.0	21.0
25	6.0	---	0	0	0	---	3.0	---	---	19.0	17.0	13.0
26	---	---	0	0	0	---	4.0	---	---	19.0	14.0	11.0
27	4.0	---	0	0	0	---	5.0	---	---	19.0	14.0	---
28	---	---	0	0	0	---	7.0	10.0	---	18.0	16.0	---
29	---	---	0	0	0	---	---	---	---	16.0	---	---
30	---	---	0	0	---	---	---	11.0	17.0	---	17.0	---
31	---	---	0	0	---	---	---	12.0	---	---	18.0	---
AVERAGE	---	---	0	0	0	---	---	---	---	---	---	---

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	82	3	.66	962	5	13	340	8	7.3
2	82	3	.66	918	5	12	320	6	5.3
3	80	3	.65	910	5	12	330	4	3.5
4	79	2	.43	910	5	12	310	4	3.3
5	82	2	.44	895	5	12	300	3	2.4
6	91	2	.49	886	5	12	300	3	2.4
7	95	2	.51	862	5	12	290	8	6.3
8	134	2	.72	778	7	15	280	11	8.3
9	166	2	.90	758	15	31	270	17	12
10	194	2	1.0	626	13	22	260	8	5.6
11	194	2	1.0	618	7	12	260	8	5.6
12	183	2	.99	622	7	12	268	8	5.8
13	181	3	1.5	622	17	29	260	8	5.6
14	185	3	1.5	626	29	49	250	8	5.4
15	192	3	1.6	646	39	68	240	8	5.2
16	196	3	1.6	654	25	44	230	7	4.3
17	235	2	1.3	650	8	14	229	7	4.3
18	299	2	1.6	642	8	14	232	7	4.4
19	358	3	2.9	630	8	14	247	7	4.7
20	354	2	1.8	650	8	14	238	7	4.5
21	327	1	.98	570	8	12	235	6	3.8
22	348	1	.94	522	8	11	232	6	3.8
23	348	2	1.9	514	8	11	230	6	3.7
24	366	3	3.0	506	8	11	220	6	3.6
25	614	11	18	414	8	8.9	220	6	3.6
26	874	21	50	398	8	8.6	220	6	3.6
27	858	16	4	390	8	8.4	220	6	3.6
28	826	12	27	380	8	8.2	220	14	8.3
29	838	10	23	360	8	7.8	210	10	5.7
30	998	8	22	350	8	7.6	210	7	4.0
31	986	5	13	---	---	---	200	7	3.8
TOTAL	10825	--	218.97	19272	--	517.5	7871	--	154.9
JANUARY									
1	200	7	3.8	125	13	4.4	100	5	1.4
2	190	4	2.1	125	18	6.1	100	5	1.4
3	180	4	1.9	125	18	6.1	100	5	1.4
4	180	5	2.4	120	18	5.8	100	5	1.4
5	170	5	2.3	120	18	5.8	100	5	1.4
6	160	5	2.2	120	17	5.5	100	5	1.4
7	160	5	2.2	120	17	5.5	100	5	1.4
8	160	5	2.2	120	17	5.5	100	5	1.4
9	150	5	2.0	120	16	5.2	100	5	1.4
10	150	5	2.0	120	16	5.2	100	5	1.4
11	150	5	2.0	115	16	5.0	100	5	1.4
12	150	5	2.0	115	15	4.7	100	5	1.4
13	145	5	2.0	115	15	4.7	100	5	1.4
14	145	5	2.0	115	15	4.7	105	5	1.4
15	145	5	2.0	115	15	4.7	110	5	1.5
16	140	5	1.9	110	13	3.9	120	5	1.6
17	140	5	1.9	110	13	3.9	140	5	1.9
18	140	5	1.9	110	11	3.3	170	5	2.3
19	140	5	1.9	105	10	2.8	200	6	3.2
20	140	5	1.9	105	9	2.6	260	7	4.9
21	135	7	2.6	105	8	2.3	300	7	5.7
22	135	7	2.6	105	7	2.0	310	7	5.9
23	130	8	2.8	105	7	2.0	300	7	5.7
24	130	8	2.8	100	7	1.9	280	7	5.3
25	130	8	2.8	100	7	1.9	280	7	5.3
26	130	9	3.2	100	7	1.9	296	7	5.6
27	130	10	3.5	100	6	1.6	344	7	6.5
28	130	10	3.5	100	6	1.6	334	13	19
29	130	10	3.5	100	5	1.4	794	20	43
30	130	10	3.5	---	---	---	1020	35	96
31	125	11	3.7	---	---	---	1220	38	125
TOTAL	4570	--	77.1	3245	--	112.0	8083	--	358.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062400 MICHIGAN RIVER NEAR WITCH LAKE, MICH.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	1270	30	103	693	6	11	722	20	39
2	1420	39	150	710	6	12	722	26	51
3	1390	38	143	718	5	9.7	722	32	72
4	1360	27	99	718	5	9.7	702	27	51
5	1340	13	47	658	4	7.1	602	25	41
6	1290	8	28	602	4	6.5	602	27	44
7	1190	10	32	506	4	5.5	698	27	51
8	1160	12	38	494	4	5.3	730	22	43
9	1100	8	24	494	3	4.0	967	49	127
10	1100	3	8.9	490	3	4.0	1160	53	166
11	1100	2	5.9	486	5	6.6	970	23	60
12	1090	2	5.9	478	2	2.6	1020	11	30
13	1100	2	5.9	386	2	2.1	1010	7	19
14	1110	2	6.0	366	4	4.0	834	10	23
15	1150	2	6.2	376	4	4.1	798	6	13
16	1190	3	9.6	446	4	4.8	770	7	15
17	1260	5	17	598	3	4.8	686	6	11
18	1270	8	26	582	3	4.7	674	6	11
19	1170	9	28	494	3	4.0	666	6	11
20	1120	6	18	518	3	4.2	634	6	10
21	1150	8	25	510	3	4.1	590	3	4.8
22	1140	9	28	494	4	5.3	654	3	5.3
23	1040	8	22	474	4	5.1	810	3	6.6
24	1060	12	34	478	4	5.2	846	3	6.9
25	1060	13	37	522	5	7.0	918	3	6.6
26	1010	7	19	522	5	7.0	738	3	6.0
27	898	7	17	586	13	21	762	3	6.2
28	870	7	16	702	28	53	914	4	8.8
29	846	7	16	878	80	190	810	4	8.8
30	782	7	15	754	36	73	786	5	11
31	--	--	--	726	23	45	--	--	--
TOTAL	33946	--	1030.4	17456	--	532.4	73312	--	950.0
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	786	5	11	642	2	3.5	198	6	3.2
2	770	5	10	618	2	3.3	482	7	9.1
3	774	5	10	598	2	3.2	502	7	9.5
4	690	3	5.6	502	2	2.7	434	7	8.2
5	574	2	3.1	438	2	2.4	422	5	5.7
6	558	1	1.5	410	4	4.5	722	17	33
7	542	2	2.9	366	3	3.0	902	15	37
8	494	2	2.7	355	2	1.9	946	15	38
9	490	3	4.0	355	1	1.0	1290	43	150
10	458	3	3.7	348	1	.94	1710	65	300
11	394	4	4.3	330	1	.89	1700	20	92
12	390	4	4.2	274	1	.74	1660	15	67
13	390	5	5.3	268	1	.72	1620	15	66
14	406	5	5.5	223	0	0	1550	15	63
15	410	7	7.7	194	0	0	1360	15	55
16	450	8	9.7	194	1	.52	1290	15	52
17	482	8	10	201	2	1.1	1110	13	39
18	630	9	15	203	2	1.1	1070	8	23
19	802	9	19	210	2	1.1	984	8	21
20	822	9	20	244	2	1.3	774	5	10
21	866	12	27	238	3	1.9	750	4	8.1
22	898	15	36	232	4	2.5	670	2	3.6
23	710	5	9.6	229	7	4.3	622	2	3.4
24	694	4	7.5	226	10	6.1	618	2	3.3
25	678	4	7.3	220	9	5.3	630	4	6.8
26	566	2	3.1	213	8	4.6	634	4	6.8
27	722	7	14	208	8	4.5	618	3	5.0
28	918	12	30	178	7	3.4	598	3	4.8
29	774	9	19	168	5	2.3	494	3	4.0
30	666	5	9.0	168	4	1.8	470	3	3.8
31	646	2	3.5	166	4	1.8	--	--	--
TOTAL	19430	--	321.2	921.9	--	72.41	26800	--	1131.3
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)									184029
TOTAL LOAD FOR YEAR (TONS)									5485.18

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04063700 POPPLE RIVER NEAR FENCE, WIS.
(Hydrologic bench-mark station)

LOCATION.--Lat 45°45'50", long 88°27'50", in NW¼ sec.23, T.38 N., R.16 E., Florence County, temperature recorder at gaging station on left bank, 20 ft upstream from U.S. Forest Service Road 2159, 1.8 miles downstream from Mud Creek, 2.6 miles northwest of Fence, and 11.5 miles upstream from mouth.

DRAINAGE AREA.--131 sq mi.

PERIOD OF RECORD.--Chemical analyses; October 1966 to September 1967 (miscellaneous), October 1967 to September 1968 (monthly).

Water temperatures: June 1964 to September 1968.

Sediment records: August 1966 to September 1968 (periodic).

EXTREMES.--1967-68:

Water temperatures: Maximum, 26.0°C July 17, Aug. 23; minimum, freezing point on many days during November to April.

Period of record:

Water temperatures: Maximum, 28.5°C July 24, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--No temperature record Sept. 21-26.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SI02)	IRON (FE)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HC03)	CAR-BONATE (C03)	SULFATE (S04)	CHLO-RIDE (CL)
OCT. 20...	110	--	--	--	--	--	--	--	--	--	--	--
DEC. 09...	64	12	.16	.00	20	12	2.1	1.6	112	0	8.8	1.0
JAN. 08...	41	14	.51	.08	27	14	1.6	1.0	140	0	10	1.0
19...	52	--	--	--	--	--	--	--	--	--	--	--
24...	37	--	--	--	--	--	--	--	--	--	--	--
FEB. 07...	40	14	.43	.06	26	13	1.9	1.0	138	0	8.4	1.0
MAR. 11...	47	14	.41	.03	25	12	1.7	.9	130	0	9.2	1.0
APR. 08...	117	6.8	.33	.03	12	5.5	1.3	.9	54	0	8.8	.5
22...	--	--	--	--	--	--	--	--	--	--	--	--
30...	216	4.0	.26	.12	9.5	4.3	1.1	.5	40	0	8.0	1.0
MAY 13...	99	5.1	.35	.06	14	7.1	1.4	.5	70	0	7.2	1.0
JUNE 17...	145	6.8	.85	.16	14	6.4	1.9	.3	66	0	5.6	.5
JULY 17...	256	8.7	.72	.06	14	5.6	1.0	.3	62	0	4.4	1.0
AUG. 16...	64	11	.63	.06	22	9.4	1.5	.5	106	0	7.6	1.0
21...	--	--	--	--	--	--	--	--	--	--	--	--
SEPT. 20...	308	9.3	.95	.06	13	6.0	1.2	.6	57	0	8.0	.2

DATE	FLUO-RIDE (F)	NITRATE (NO3)	TOTAL PHOS-PHORUS (PO4)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARD-NESS (CA-MG)	NON-CAR-BONATE HARD-NESS	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHDS)	PH
OCT. 20...	--	--	--	--	--	--	--	--	--	--	--	7.2
DEC. 09...	.2	1.0	.40	111	114	.15	--	100	8	.1	187	7.3
JAN. 08...	.2	1.2	.05	146	139	.20	--	125	10	.1	232	7.3
19...	--	--	--	--	--	--	--	--	--	--	230	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
FEB. 07...	.2	2.0	.06	141	136	.19	--	119	6	.1	229	7.4
MAR. 11...	.2	1.7	.07	141	130	.19	--	112	6	.1	220	7.5
APR. 08...	.2	1.4	.06	97	63	.13	--	52	8	.1	108	6.9
22...	--	--	--	--	--	--	--	--	--	--	--	--
30...	.3	1.0	.04	75	50	.10	--	41	8	.1	83	6.8
MAY 13...	.2	.8	.07	65	71	.09	--	64	6	.1	126	7.3
JUNE 17...	.3	1.4	.06	79	69	.11	--	62	8	.1	112	7.2
JULY 17...	.2	1.6	.07	92	67	.13	63	58	7	.1	103	6.8
AUG. 16...	.2	.9	.06	116	106	.16	--	94	6	.1	173	7.2
21...	--	--	--	--	--	--	--	--	--	--	--	--
SEPT. 20...	.3	.8	.07	130	68	.18	--	57	10	.1	103	6.7

04063700 POPPLE RIVER NEAR FENCE, WIS.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.0	2.0	11.0	6.0	15.0	12.0	16.0	15.0	18.0	16.0	17.0	14.0
2	5.0	3.0	12.0	9.0	15.0	13.0	16.0	14.0	19.0	16.0	14.0	14.0
3	4.0	3.0	11.0	8.0	16.0	12.0	14.0	12.0	21.0	18.0	16.0	14.0
4	3.0	1.0	8.0	6.0	19.0	14.0	16.0	13.0	22.0	19.0	17.0	16.0
5	4.0	0	9.0	5.0	21.0	18.0	17.0	14.0	21.0	21.0	16.0	14.0
6	4.0	1.0	8.0	6.0	22.0	19.0	16.0	14.0	22.0	19.0	16.0	13.0
7	7.0	3.0	8.0	6.0	22.0	19.0	17.0	16.0	22.0	20.0	13.0	12.0
8	6.0	4.0	11.0	7.0	22.0	20.0	19.0	16.0	23.0	16.0	12.0	12.0
9	6.0	3.0	10.0	9.0	22.0	20.0	19.0	17.0	23.0	20.0	12.0	12.0
10	7.0	4.0	11.0	8.0	21.0	19.0	18.0	15.0	20.0	18.0	12.0	12.0
11	6.0	4.0	12.0	8.0	21.0	18.0	19.0	16.0	19.0	16.0	12.0	11.0
12	12.0	7.0	11.0	9.0	18.0	16.0	19.0	18.0	18.0	16.0	18.0	12.0
13	11.0	7.0	14.0	8.0	16.0	13.0	19.0	17.0	20.0	17.0	13.0	12.0
14	7.0	4.0	16.0	11.0	16.0	14.0	19.0	17.0	20.0	17.0	14.0	13.0
15	7.0	3.0	16.0	9.0	16.0	13.0	20.0	17.0	18.0	17.0	15.0	13.0
16	8.0	6.0	15.0	10.0	15.0	13.0	22.0	19.0	21.0	21.0	16.0	14.0
17	8.0	7.0	11.0	8.0	16.0	13.0	26.0	21.0	21.0	18.0	16.0	15.0
18	7.0	6.0	11.0	9.0	16.0	14.0	19.0	16.0	18.0	16.0	15.0	15.0
19	8.0	5.0	11.0	9.0	17.0	13.0	21.0	19.0	19.0	16.0	16.0	14.0
20	7.0	6.0	12.0	10.0	16.0	13.0	21.0	18.0	21.0	18.0	19.0	13.0
21	6.0	5.0	12.0	9.0	14.0	12.0	21.0	19.0	21.0	21.0	---	---
22	6.0	4.0	12.0	9.0	15.0	11.0	21.0	19.0	23.0	19.0	---	---
23	6.0	5.0	11.0	8.0	15.0	14.0	21.0	18.0	26.0	19.0	---	---
24	5.0	3.0	11.0	7.0	14.0	13.0	19.0	17.0	24.0	22.0	---	---
25	3.0	2.0	11.0	9.0	14.0	13.0	20.0	17.0	22.0	21.0	---	---
26	4.0	1.0	10.0	10.0	13.0	10.0	20.0	18.0	21.0	16.0	---	---
27	7.0	3.0	9.0	9.0	10.0	9.0	20.0	18.0	17.0	13.0	13.0	11.0
28	7.0	6.0	9.0	8.0	12.0	9.0	19.0	16.0	18.0	14.0	12.0	11.0
29	8.0	6.0	8.0	8.0	14.0	11.0	17.0	15.0	18.0	16.0	13.0	11.0
30	8.0	6.0	11.0	8.0	16.0	14.0	18.0	15.0	18.0	16.0	13.0	11.0
31	---	---	13.0	10.0	---	---	18.0	17.0	18.0	14.0	---	---
MCNTH	12.0	0	16.0	5.0	22.0	9.0	26.0	12.0	26.0	13.0	19.0	11.0

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
OCT 2, 1967.	1715	67	6	1	NOV 10, 1967	1930	108	9	3
OCT 4.....	1715	67	10	2	NOV 12.....	2000	104	6	2
OCT 6.....	1705	64	4	1	NOV 14.....	1900	96	10	3
OCT 8.....	1700	126	5	2	NOV 16.....	1700	92	8	2
OCT 10.....	1910	229	6	4	NOV 18.....	1930	90	10	2
OCT 12.....	1900	191	2	1	NOV 20.....	2130	90	1	T
OCT 14.....	1705	178	1	T	NOV 22.....	1645	86	1	T
OCT 16.....	1730	172	1	T	NOV 24.....	1650	80	1	T
OCT 18.....	1810	135	1	T	NOV 26.....	1700	74	1	T
OCT 20.....	1905	121	1	T	NOV 28.....	1645	68	1	T
OCT 22.....	1745	117	1	T	NOV 30.....	1700	64	2	T
OCT 24.....	1800	117	8	3	DEC 2.....	1640	64	1	T
OCT 26.....	1645	386	1	1	DEC 4.....	1800	66	12	2
OCT 27.....	1705	420	2	2	DEC 6.....	0745	64	12	2
OCT 28.....	1445	394	1	1	APR 5, 1968.	1700	138	2	1
OCT 29.....	1805	354	4	4	APR 27.....	1505	319	2	2
OCT 31.....	1755	308	4	3	AUG 16.....	1345	63	1	T
NOV 2.....	1730	264	4	3	SEPT 11.....	1445	659	1	T
NOV 4.....	1630	210	4	2	SEPT 20.....	1130	308	0	0
NOV 6.....	1740	156	14	6	OCT 17.....	1540	131	0	0
NOV 8.....	1840	124	11	4					

T LESS THAN 0.50 TON.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04065500 STURGEON RIVER NEAR FOSTER CITY, MICH.

LOCATION,--Lat 45°54'30", long 87°45'15", in NW 1/4 sec.36, T.41 N., R.28 W., Dickinson County, temperature recorder at gaging station on left bank, 30 ft downstream from bridge on County Highway 569, 1.8 miles downstream from confluence of East and West branches, and 4 miles south of Foster City.

DRAINAGE AREA,--237 sq mi.

PERIOD OF RECORD,--Water temperatures: July 1956 to September 1968.

EXTREMES,--1967-68:

Water temperatures: Maximum, 25.0°C Aug. 7, 8; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 30.0°C July 1, 1963; minimum, freezing point on many days during winter periods.

REMARKS,--Complete ice cover during winter months. Recorder stopped Oct. 18 to Dec. 6; no range in temperature.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	8.0	---	---	---	---	0	0	0	0	0	0
2	14.0	11.0	---	---	---	---	0	0	0	0	0	0
3	15.0	13.0	---	---	---	---	0	0	0	0	0	0
4	16.0	13.0	---	---	---	---	0	0	0	0	0	0
5	15.0	12.0	---	---	---	---	0	0	0	0	0	0
6	14.0	12.0	---	---	---	---	0	0	0	0	0	0
7	12.0	11.0	---	---	0	0	0	0	0	0	0	0
8	11.0	9.0	---	---	0	0	0	0	0	0	0	0
9	5.0	9.0	---	---	0	0	0	0	0	0	0	0
10	5.0	8.0	---	---	0	0	0	0	0	0	0	0
11	8.0	7.0	---	---	0	0	0	0	0	0	0	0
12	8.0	6.0	---	---	0	0	0	0	0	0	0	0
13	8.0	7.0	---	---	0	0	0	0	0	0	0	0
14	9.0	7.0	---	---	0	0	0	0	0	0	0	0
15	9.0	9.0	---	---	0	0	0	0	0	0	0	0
16	11.0	9.0	---	---	0	0	0	0	0	0	0	0
17	11.0	9.0	---	---	0	0	0	0	0	0	0	0
18	---	---	---	---	0	0	0	0	0	0	0	0
19	---	---	---	---	0	0	0	0	0	0	0	0
20	---	---	---	---	0	0	0	0	0	0	0	0
21	---	---	---	---	0	0	0	0	0	0	0	0
22	---	---	---	---	0	0	0	0	0	0	0	0
23	---	---	---	---	0	0	0	0	0	0	0	0
24	---	---	---	---	0	0	0	0	0	0	0	0
25	---	---	---	---	0	0	0	0	0	0	0	0
26	---	---	---	---	0	0	0	0	0	0	1.0	0
27	---	---	---	---	0	0	0	0	0	0	1.0	0
28	---	---	---	---	0	0	0	0	0	0	2.0	0
29	---	---	---	---	0	0	0	0	0	0	3.0	1.0
30	---	---	---	---	0	0	0	0	---	---	5.0	3.0
31	---	---	---	---	0	0	0	0	---	---	5.0	4.0
MCNTH	---	---	---	---	0	0	0	0	0	0	5.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.0	4.0	10.0	7.0	15.0	13.0	17.0	16.0	21.0	19.0	19.0	18.0
2	5.0	4.0	11.0	8.0	15.0	14.0	16.0	16.0	21.0	19.0	18.0	17.0
3	5.0	4.0	11.0	8.0	16.0	13.0	16.0	15.0	23.0	20.0	17.0	16.0
4	4.0	3.0	8.0	6.0	18.0	15.0	16.0	15.0	24.0	21.0	18.0	17.0
5	5.0	2.0	8.0	5.0	21.0	17.0	17.0	16.0	23.0	22.0	18.0	17.0
6	6.0	3.0	8.0	6.0	22.0	20.0	17.0	16.0	23.0	21.0	18.0	16.0
7	7.0	4.0	7.0	6.0	22.0	20.0	18.0	17.0	25.0	22.0	16.0	14.0
8	6.0	5.0	10.0	7.0	22.0	20.0	20.0	17.0	25.0	23.0	14.0	14.0
9	6.0	4.0	10.0	9.0	22.0	21.0	21.0	20.0	24.0	22.0	14.0	14.0
10	6.0	5.0	10.0	8.0	21.0	19.0	20.0	17.0	22.0	19.0	14.0	14.0
11	7.0	5.0	11.0	9.0	20.0	19.0	20.0	18.0	20.0	18.0	14.0	13.0
12	10.0	6.0	11.0	10.0	19.0	17.0	20.0	20.0	20.0	18.0	15.0	14.0
13	10.0	7.0	13.0	9.0	17.0	15.0	21.0	20.0	22.0	18.0	15.0	14.0
14	7.0	5.0	12.0	11.0	17.0	16.0	21.0	20.0	21.0	19.0	15.0	14.0
15	6.0	4.0	14.0	11.0	17.0	15.0	23.0	20.0	21.0	18.0	16.0	15.0
16	8.0	5.0	14.0	11.0	17.0	15.0	24.0	22.0	22.0	19.0	17.0	16.0
17	8.0	7.0	11.0	9.0	16.0	15.0	24.0	23.0	22.0	20.0	17.0	17.0
18	7.0	7.0	12.0	10.0	16.0	15.0	23.0	22.0	20.0	17.0	17.0	17.0
19	8.0	6.0	12.0	10.0	17.0	14.0	23.0	20.0	21.0	18.0	17.0	16.0
20	8.0	7.0	13.0	11.0	16.0	14.0	22.0	20.0	22.0	20.0	17.0	17.0
21	7.0	6.0	12.0	11.0	16.0	14.0	22.0	20.0	22.0	20.0	17.0	16.0
22	7.0	6.0	12.0	11.0	16.0	13.0	22.0	20.0	23.0	20.0	17.0	16.0
23	7.0	7.0	12.0	11.0	16.0	15.0	21.0	19.0	24.0	22.0	18.0	17.0
24	7.0	4.0	12.0	9.0	15.0	14.0	21.0	19.0	24.0	23.0	16.0	17.0
25	4.0	3.0	13.0	11.0	15.0	14.0	21.0	19.0	23.0	20.0	17.0	15.0
26	4.0	2.0	13.0	12.0	14.0	12.0	21.0	20.0	20.0	18.0	15.0	14.0
27	7.0	3.0	12.0	10.0	12.0	12.0	21.0	20.0	19.0	16.0	14.0	13.0
28	7.0	5.0	10.0	9.0	12.0	11.0	21.0	19.0	19.0	16.0	13.0	12.0
29	7.0	6.0	9.0	9.0	15.0	12.0	20.0	18.0	20.0	17.0	13.0	11.0
30	9.0	6.0	11.0	9.0	16.0	15.0	20.0	19.0	20.0	17.0	14.0	12.0
31	---	---	13.0	10.0	---	---	21.0	20.0	19.0	18.0	---	---
MCNTH	10.0	2.0	14.0	5.0	22.0	11.0	24.0	15.0	25.0	16.0	19.0	11.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106300 PORTAGE CREEK NEAR KALAMAZOO, MICH.

LOCATION.--Lat 42°14'46", long 85°34'33", in SE¼ sec.34, T.2 S., R.11 W., Kalamazoo County, at gaging station on left bank 25 ft upstream from bridge on Lovers Lane and 3.0 miles south of Kalamazoo.

DRAINAGE AREA.--22.4 sq mi.

PERIOD OF RECORD.--Chemical analyses: April to September 1968.

Water temperatures: July to September 1968.

REMARKS.--Continuous specific conductance recorder installed Apr. 6 removed May 6, reinstalled Sept. 21. No records available for Apr. 24-30; recorder failed.

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), APRIL TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
1.....	--	--	480	460	--	--	--	--	--	--	--	--
2.....	--	--	480	470	--	--	--	--	--	--	--	--
3.....	--	--	490	460	--	--	--	--	--	--	--	--
4.....	--	--	480	470	--	--	--	--	--	--	--	--
5.....	--	--	470	460	--	--	--	--	--	--	--	--
6.....	460	460	500	460	--	--	--	--	--	--	--	--
7.....	460	460	490	470	--	--	--	--	--	--	--	--
8.....	550	460	500	480	--	--	--	--	--	--	--	--
9.....	490	470	--	--	--	--	--	--	--	--	--	--
10.....	480	480	--	--	--	--	--	--	--	--	--	--
11.....	480	470	--	--	--	--	--	--	--	--	--	--
12.....	480	460	--	--	--	--	--	--	--	--	--	--
13.....	460	460	--	--	--	--	--	--	--	--	--	--
14.....	460	270	--	--	--	--	--	--	--	--	--	--
15.....	460	360	--	--	--	--	--	--	--	--	--	--
16.....	470	440	--	--	--	--	--	--	--	--	--	--
17.....	460	440	--	--	--	--	--	--	--	--	--	--
18.....	460	440	--	--	--	--	--	--	--	--	--	--
19.....	475	460	--	--	--	--	--	--	--	--	--	--
20.....	460	460	--	--	--	--	--	--	--	--	--	--
21.....	460	460	--	--	--	--	--	--	--	--	510	490
22.....	490	460	--	--	--	--	--	--	--	--	500	440
23.....	470	460	--	--	--	--	--	--	--	--	510	470
24.....	--	--	--	--	--	--	--	--	--	--	520	440
25.....	--	--	--	--	--	--	--	--	--	--	510	480
26.....	--	--	--	--	--	--	--	--	--	--	530	490
27.....	--	--	--	--	--	--	--	--	--	--	520	500
28.....	--	--	--	--	--	--	--	--	--	--	540	490
29.....	--	--	--	--	--	--	--	--	--	--	500	500
30.....	--	--	--	--	--	--	--	--	--	--	520	500
31.....	--	--	--	--	--	--	--	--	--	--	--	--
AVERAGE	--	--	--	--	--	--	--	--	--	--	--	--

TEMPERATURE (°C) OF WATER, JULY TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	---	---	---	---	---	---	22.0	18.0	22.0	16.0	19.0	16.0
2	---	---	---	---	---	---	19.0	16.0	23.0	15.0	20.0	14.0
3	---	---	---	---	---	---	20.0	13.0	22.0	17.0	23.0	15.0
4	---	---	---	---	---	---	18.0	13.0	23.0	18.0	21.0	17.0
5	---	---	---	---	---	---	21.0	14.0	23.0	19.0	21.0	18.0
6	---	---	---	---	---	---	21.0	14.0	26.0	21.0	20.0	15.0
7	---	---	---	---	---	---	21.0	15.0	26.0	21.0	20.0	14.0
8	---	---	---	---	---	---	23.0	16.0	24.0	20.0	20.0	16.0
9	---	---	---	---	---	---	23.0	18.0	23.0	20.0	20.0	17.0
10	---	---	---	---	---	---	22.0	17.0	23.0	19.0	19.0	17.0
11	---	---	---	---	---	---	23.0	18.0	21.0	15.0	18.0	16.0
12	---	---	---	---	---	---	24.0	18.0	23.0	15.0	20.0	14.0
13	---	---	---	---	---	---	24.0	18.0	23.0	18.0	21.0	16.0
14	---	---	---	---	---	---	24.0	19.0	23.0	18.0	21.0	16.0
15	---	---	---	---	---	---	25.0	21.0	21.0	16.0	21.0	16.0
16	---	---	---	---	---	---	---	---	24.0	19.0	20.0	15.0
17	---	---	---	---	---	---	25.0	20.0	23.0	19.0	19.0	17.0
18	---	---	---	---	---	---	22.0	21.0	22.0	17.0	18.0	17.0
19	---	---	---	---	---	---	24.0	18.0	25.0	19.0	18.0	15.0
20	---	---	---	---	---	---	24.0	17.0	24.0	20.0	18.0	16.0
21	---	---	---	---	---	---	24.0	18.0	25.0	19.0	20.0	15.0
22	---	---	---	---	---	---	25.0	20.0	25.0	19.0	19.0	16.0
23	---	---	---	---	---	---	21.0	17.0	25.0	20.0	20.0	16.0
24	---	---	---	---	---	---	22.0	20.0	25.0	20.0	19.0	16.0
25	---	---	---	---	---	---	24.0	19.0	21.0	17.0	17.0	13.0
26	---	---	---	---	18.0	16.0	24.0	19.0	18.0	14.0	17.0	12.0
27	---	---	---	---	16.0	14.0	23.0	19.0	20.0	13.0	17.0	12.0
28	---	---	---	---	17.0	13.0	22.0	17.0	20.0	14.0	17.0	13.0
29	---	---	---	---	17.0	15.0	22.0	15.0	21.0	14.0	16.0	14.0
30	---	---	---	---	23.0	16.0	23.0	16.0	21.0	15.0	18.0	13.0
31	---	---	---	---	---	---	22.0	17.0	20.0	15.0	---	---
MCNTH	---	---	---	---	---	---	25.0	13.0	26.0	13.0	23.0	12.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106500 PORTAGE CREEK AT KALAMAZOO, MICH.

LOCATION.--Lat 42°16'30", long 85°34'35", SE¼ sec.22, T.2 S., R.11 W., Kalamazoo County, on left bank of bridge on downstream side of Reed St. at Kalamazoo, 1.5 miles upstream from mouth.

DRAINAGE AREA.--48 sq mi, approximately.

PERIOD OF RECORD.--Specific conductance: May to September 1968 (discontinued).

REMARKS.--Continuous specific conductance recorder installed May 10, removed Sept. 20. No records available for July 1 to July 23; recorder failed.

SPECIFIC CONDUCTANCE (MICROMHDS AT 25°C), MAY TO SEPTEMBER 1968												
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
1.....	---	---	---	---	610	500	---	---	580	550	840	370
2.....	---	---	---	---	720	530	---	---	640	560	490	470
3.....	---	---	---	---	540	480	---	---	560	500	570	470
4.....	---	---	---	---	580	540	---	---	530	490	620	670
5.....	---	---	---	---	580	540	---	---	500	480	610	570
6.....	---	---	---	---	630	570	---	---	550	500	610	610
7.....	---	---	---	---	670	630	---	---	600	550	660	610
8.....	---	---	---	---	730	620	---	---	610	460	720	580
9.....	---	---	---	---	670	570	---	---	680	470	600	320
10.....	---	---	560	500	630	600	---	---	900	540	600	530
11.....	---	---	650	580	650	380	---	---	560	460	640	610
12.....	---	---	750	530	1450	540	---	---	470	420	660	630
13.....	---	---	550	490	570	550	---	---	510	470	650	580
14.....	---	---	600	450	600	560	---	---	560	510	660	650
15.....	---	---	610	500	540	580	---	---	550	520	870	610
16.....	---	---	610	460	900	640	---	---	630	400	620	570
17.....	---	---	550	500	1020	800	---	---	610	510	640	620
18.....	---	---	620	540	1020	600	---	---	870	530	660	640
19.....	---	---	750	480	790	570	---	---	510	490	610	570
20.....	---	---	520	460	850	780	---	---	530	510	---	---
21.....	---	---	600	520	850	760	---	---	550	510	---	---
22.....	---	---	630	560	750	580	---	---	570	540	---	---
23.....	---	---	600	550	800	350	---	---	650	560	---	---
24.....	---	---	610	550	510	600	480	220	620	570	---	---
25.....	---	---	610	550	510	150	480	340	820	570	---	---
26.....	---	---	770	540	210	160	550	480	600	510	---	---
27.....	---	---	540	490	260	210	560	400	630	600	---	---
28.....	---	---	550	520	290	260	630	460	600	600	---	---
29.....	---	---	580	540	310	220	520	450	730	640	---	---
30.....	---	---	630	550	310	300	575	520	680	500	---	---
31.....	---	---	620	510	---	---	600	560	680	640	---	---
AVERAGE	---	---	---	---	656	504	---	---	613	524	---	---

04111000 GRAND RIVER NEAR EATON RAPIDS, MICH.

LOCATION.--Lat 42°33'05", long 84°37'25", in NE¼ sec.26, T.2 N., R.3 W., Eaton County, temperature recorder at gaging station on right bank, 400 ft upstream from bridge on Petrieville Highway, 2 miles northeast of Eaton Rapids, 2.5 miles downstream from Spring Brook, 25 miles upstream from Cedar River, and at mile 178.

DRAINAGE AREA.--661 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1963 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, not recorded; minimum, freezing point on several days January to March.

Period of record:

Water temperatures: Maximum, 35.0°C Aug. 2, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--Clock stopped Nov. 21 to Jan. 22; range in temperature, freezing point to 4.0°C. No temperature record June 1 to Sept. 30; probe buried.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)												
DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	14.0	9.0	8.0	7.0	---	---	---	---	0	0	0	0
2	17.0	12.0	8.0	8.0	---	---	---	---	0	0	0	0
3	18.0	14.0	8.0	8.0	---	---	---	---	0	0	0	0
4	18.0	15.0	8.0	6.0	---	---	---	---	0	0	1.0	0
5	18.0	16.0	6.0	5.0	---	---	---	---	0	0	1.0	0
6	16.0	13.0	5.0	4.0	---	---	---	---	0	0	1.0	0
7	15.0	10.0	4.0	3.0	---	---	---	---	0	0	1.0	0
8	16.0	14.0	3.0	3.0	---	---	---	---	0	0	1.0	0
9	18.0	11.0	4.0	4.0	---	---	---	---	0	0	1.0	1.0
10	12.0	11.0	5.0	4.0	---	---	---	---	0	0	2.0	1.0
11	11.0	9.0	6.0	5.0	---	---	---	---	0	0	5.0	3.0
12	12.0	9.0	6.0	6.0	---	---	---	---	0	0	4.0	3.0
13	12.0	10.0	6.0	6.0	---	---	---	---	0	0	3.0	2.0
14	13.0	11.0	6.0	5.0	---	---	---	---	0	0	2.0	2.0
15	12.0	11.0	4.0	3.0	---	---	---	---	0	0	3.0	2.0
16	12.0	12.0	4.0	3.0	---	---	---	---	0	0	5.0	3.0
17	12.0	11.0	3.0	3.0	---	---	---	---	0	0	6.0	4.0
18	11.0	10.0	3.0	3.0	---	---	---	---	0	0	7.0	5.0
19	11.0	9.0	3.0	3.0	---	---	---	---	0	0	7.0	6.0
20	10.0	9.0	3.0	3.0	---	---	---	---	0	0	7.0	7.0
21	5.0	8.0	---	---	---	---	---	---	0	0	7.0	7.0
22	5.0	7.0	---	---	---	---	---	---	0	0	6.0	6.0
23	10.0	8.0	---	---	---	---	0	0	0	0	7.0	3.0
24	11.0	9.0	---	---	---	---	0	0	0	0	5.0	3.0
25	10.0	8.0	---	---	---	---	0	0	0	0	6.0	4.0
26	8.0	7.0	---	---	---	---	0	0	0	0	9.0	6.0
27	7.0	6.0	---	---	---	---	0	0	0	0	10.0	8.0
28	6.0	6.0	---	---	---	---	0	0	0	0	12.0	10.0
29	6.0	5.0	---	---	---	---	0	0	0	0	12.0	12.0
30	7.0	6.0	---	---	---	---	0	0	---	---	12.0	12.0
31	7.0	7.0	---	---	---	---	0	0	---	---	12.0	12.0
MCNTH	18.0	5.0	---	---	---	---	---	---	0	0	12.0	0

0411000 GRAND RIVER NEAR EATON RAPIDS, MICH.--Continued
TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	11.0	15.0	12.0	---	---	---	---	---	---	---	---
2	12.0	10.0	16.0	13.0	---	---	---	---	---	---	---	---
3	11.0	11.0	16.0	14.0	---	---	---	---	---	---	---	---
4	13.0	11.0	16.0	14.0	---	---	---	---	---	---	---	---
5	12.0	11.0	15.0	13.0	---	---	---	---	---	---	---	---
6	11.0	10.0	16.0	12.0	---	---	---	---	---	---	---	---
7	12.0	10.0	16.0	13.0	---	---	---	---	---	---	---	---
8	13.0	11.0	16.0	14.0	---	---	---	---	---	---	---	---
9	13.0	12.0	18.0	14.0	---	---	---	---	---	---	---	---
10	13.0	13.0	18.0	14.0	---	---	---	---	---	---	---	---
11	13.0	12.0	17.0	15.0	---	---	---	---	---	---	---	---
12	14.0	13.0	18.0	15.0	---	---	---	---	---	---	---	---
13	16.0	14.0	17.0	15.0	---	---	---	---	---	---	---	---
14	16.0	15.0	16.0	15.0	---	---	---	---	---	---	---	---
15	16.0	15.0	18.0	16.0	---	---	---	---	---	---	---	---
16	15.0	14.0	18.0	15.0	---	---	---	---	---	---	---	---
17	15.0	14.0	19.0	14.0	---	---	---	---	---	---	---	---
18	14.0	14.0	17.0	13.0	---	---	---	---	---	---	---	---
19	16.0	14.0	16.0	14.0	---	---	---	---	---	---	---	---
20	15.0	14.0	15.0	13.0	---	---	---	---	---	---	---	---
21	14.0	14.0	16.0	13.0	---	---	---	---	---	---	---	---
22	16.0	13.0	16.0	13.0	---	---	---	---	---	---	---	---
23	16.0	15.0	15.0	14.0	---	---	---	---	---	---	---	---
24	15.0	13.0	17.0	13.0	---	---	---	---	---	---	---	---
25	13.0	10.0	17.0	14.0	---	---	---	---	---	---	---	---
26	10.0	9.0	16.0	14.0	---	---	---	---	---	---	---	---
27	12.0	9.0	14.0	14.0	---	---	---	---	---	---	---	---
28	12.0	9.0	14.0	13.0	---	---	---	---	---	---	---	---
29	14.0	11.0	13.0	13.0	---	---	---	---	---	---	---	---
30	15.0	12.0	13.0	13.0	---	---	---	---	---	---	---	---
31	---	---	14.0	13.0	---	---	---	---	---	---	---	---
MCNTH	16.0	9.0	18.0	12.0	---	---	---	---	---	---	---	---

04113000 GRAND RIVER AT LANSING, MICH.

LOCATION.--Lat 42°45'05". long 84°33'20", in NW¼ sec.9, T.4 N., R.2 W., Ingham County, temperature recorder at gaging station on right bank 30 ft. upstream from bridge on North Grand River Avenue in Lansing, 2 miles downstream from Cedar River, and at mile 152.

DRAINAGE AREA.--1,230 approximately.

PERIOD OF RECORD.--Water temperatures: October 1963 to September 1964, October 1966 to September 1968.

EXTREMES.--1966-67:

Water temperatures: Maximum 27.0°C June 9-12; minimum, freezing point Feb. 3-7, 15, 17.

Period of record:

Water temperatures: Maximum, 29.5°C July 12, 24, Aug. 16, 17, 1967; minimum, freezing point on several days during winter periods.

REMARKS.--No temperature record July 6 to Sept. 30.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	18.0	16.0	12.0	11.0	6.0	5.0	1.0	1.0	1.0	1.0	5.0	4.0
2	20.0	17.0	12.0	12.0	6.0	5.0	3.0	1.0	1.0	1.0	5.0	4.0
3	17.0	21.0	12.0	11.0	5.0	4.0	3.0	2.0	1.0	0	4.0	3.0
4	23.0	20.0	11.0	8.0	5.0	4.0	3.0	2.0	0	0	6.0	3.0
5	23.0	22.0	8.0	7.0	7.0	5.0	3.0	2.0	0	0	6.0	6.0
6	22.0	20.0	7.0	7.0	7.0	6.0	3.0	3.0	0	0	6.0	6.0
7	20.0	18.0	7.0	7.0	7.0	6.0	3.0	2.0	1.0	0	6.0	6.0
8	19.0	18.0	7.0	7.0	7.0	6.0	3.0	2.0	1.0	1.0	6.0	5.0
9	18.0	17.0	7.0	7.0	6.0	5.0	3.0	3.0	1.0	1.0	5.0	4.0
10	17.0	17.0	8.0	7.0	5.0	4.0	4.0	3.0	1.0	1.0	4.0	3.0
11	17.0	17.0	8.0	8.0	4.0	4.0	4.0	3.0	1.0	1.0	5.0	3.0
12	18.0	17.0	8.0	8.0	4.0	4.0	4.0	3.0	1.0	1.0	5.0	3.0
13	18.0	17.0	8.0	8.0	4.0	4.0	4.0	3.0	1.0	1.0	5.0	3.0
14	18.0	17.0	8.0	7.0	4.0	3.0	3.0	2.0	1.0	1.0	5.0	4.0
15	18.0	16.0	7.0	6.0	3.0	3.0	3.0	2.0	1.0	0	5.0	4.0
16	16.0	15.0	6.0	5.0	3.0	2.0	4.0	3.0	1.0	1.0	5.0	5.0
17	17.0	16.0	6.0	6.0	2.0	2.0	5.0	4.0	1.0	0	5.0	5.0
18	17.0	16.0	6.0	5.0	3.0	2.0	5.0	4.0	1.0	1.0	8.0	5.0
19	17.0	15.0	5.0	4.0	3.0	3.0	5.0	4.0	2.0	1.0	10.0	8.0
20	15.0	12.0	5.0	4.0	3.0	3.0	4.0	3.0	2.0	1.0	10.0	10.0
21	12.0	11.0	5.0	5.0	4.0	3.0	3.0	3.0	2.0	2.0	10.0	10.0
22	12.0	11.0	5.0	5.0	4.0	4.0	3.0	3.0	3.0	2.0	10.0	8.0
23	13.0	10.0	5.0	4.0	4.0	2.0	3.0	3.0	3.0	2.0	8.0	5.0
24	14.0	13.0	5.0	4.0	2.0	1.0	3.0	3.0	4.0	3.0	5.0	5.0
25	14.0	14.0	5.0	5.0	1.0	1.0	3.0	3.0	3.0	2.0	7.0	5.0
26	14.0	14.0	5.0	5.0	2.0	1.0	4.0	3.0	4.0	2.0	8.0	7.0
27	14.0	11.0	6.0	5.0	2.0	1.0	4.0	3.0	4.0	4.0	9.0	8.0
28	12.0	10.0	6.0	5.0	2.0	1.0	4.0	4.0	5.0	4.0	11.0	9.0
29	10.0	7.0	6.0	5.0	2.0	1.0	4.0	2.0	4.0	4.0	13.0	11.0
30	10.0	7.0	6.0	5.0	2.0	1.0	2.0	1.0	---	---	13.0	12.0
31	11.0	10.0	---	---	1.0	1.0	1.0	0	---	---	13.0	12.0
MCNTH	23.0	7.0	12.0	4.0	7.0	1.0	5.0	0	5.0	0	13.0	3.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04113000 GRAND RIVER AT LANSING, MICH.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	11.0	18.0	16.0	15.0	15.0	20.0	19.0	---	---	---	---
2	12.0	11.0	19.0	18.0	17.0	15.0	20.0	20.0	---	---	---	---
3	12.0	12.0	19.0	18.0	19.0	17.0	21.0	20.0	---	---	---	---
4	13.0	12.0	18.0	17.0	21.0	19.0	20.0	19.0	---	---	---	---
5	13.0	12.0	17.0	16.0	23.0	21.0	20.0	19.0	---	---	---	---
6	12.0	11.0	17.0	15.0	24.0	22.0	---	---	---	---	---	---
7	11.0	10.0	18.0	16.0	26.0	24.0	---	---	---	---	---	---
8	13.0	11.0	18.0	17.0	26.0	25.0	---	---	---	---	---	---
9	13.0	12.0	20.0	18.0	27.0	25.0	---	---	---	---	---	---
10	14.0	13.0	21.0	19.0	27.0	26.0	---	---	---	---	---	---
11	14.0	13.0	21.0	19.0	27.0	27.0	---	---	---	---	---	---
12	14.0	13.0	20.0	19.0	27.0	24.0	---	---	---	---	---	---
13	16.0	14.0	21.0	18.0	24.0	22.0	---	---	---	---	---	---
14	16.0	16.0	21.0	20.0	24.0	22.0	---	---	---	---	---	---
15	16.0	15.0	23.0	20.0	24.0	23.0	---	---	---	---	---	---
16	16.0	15.0	23.0	22.0	24.0	22.0	---	---	---	---	---	---
17	16.0	15.0	22.0	19.0	23.0	22.0	---	---	---	---	---	---
18	16.0	15.0	20.0	18.0	23.0	23.0	---	---	---	---	---	---
19	17.0	15.0	19.0	17.0	24.0	22.0	---	---	---	---	---	---
20	17.0	16.0	18.0	17.0	25.0	23.0	---	---	---	---	---	---
21	16.0	15.0	19.0	18.0	25.0	24.0	---	---	---	---	---	---
22	17.0	15.0	20.0	19.0	24.0	22.0	---	---	---	---	---	---
23	18.0	17.0	20.0	20.0	22.0	22.0	---	---	---	---	---	---
24	18.0	16.0	22.0	20.0	23.0	22.0	---	---	---	---	---	---
25	16.0	13.0	21.0	20.0	23.0	20.0	---	---	---	---	---	---
26	13.0	12.0	20.0	17.0	20.0	18.0	---	---	---	---	---	---
27	13.0	12.0	17.0	17.0	19.0	17.0	---	---	---	---	---	---
28	14.0	13.0	17.0	15.0	17.0	17.0	---	---	---	---	---	---
29	16.0	14.0	15.0	14.0	17.0	17.0	---	---	---	---	---	---
30	17.0	16.0	14.0	13.0	19.0	17.0	---	---	---	---	---	---
31	---	---	15.0	13.0	---	---	---	---	---	---	---	---
MONTH	18.0	10.0	23.0	13.0	27.0	15.0	---	---	---	---	---	---

04114000 GRAND RIVER AT PORTLAND, MICH.

LOCATION.--Lat 42°51'20", long 84°54'45", in NW 1/4 sec. 4, T.5 N., R.5 W., Ionia County, temperature recorder at gaging station on left bank at downstream side of bridge on Kent Street, 1.0 mile south of Portland, 1.9 miles upstream from Lookingglass River, and at mile 115.

DRAINAGE AREA.--1,385 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1963 to June 25, 1968 (discontinued).

EXTREMES.--1967-68:

Water temperatures: Maximum, 25.0°C June 9-12; minimum, freezing point on several days during January, February, and March.

Period of record:

Water temperatures: Maximum, 35.0°C Aug. 3, 1964; minimum freezing point on many days during winter periods.

REMARKS.--No temperature record June 14-21; range in temperature, 19.0°C to 21.0°C.

TEMPERATURE (°C) OF WATER, OCTOBER 1967 TO JUNE 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	10.0	8.0	8.0	2.0	2.0	2.0	1.0	2.0	2.0	0	0
2	17.0	13.0	8.0	8.0	2.0	2.0	1.0	1.0	2.0	1.0	0	0
3	19.0	16.0	8.0	8.0	2.0	2.0	1.0	0	1.0	0	0	0
4	21.0	18.0	8.0	7.0	2.0	2.0	0	0	1.0	0	1.0	0
5	21.0	19.0	7.0	6.0	2.0	2.0	0	0	1.0	1.0	4.0	1.0
6	19.0	14.0	6.0	5.0	3.0	2.0	0	0	1.0	1.0	4.0	2.0
7	14.0	13.0	5.0	5.0	4.0	3.0	0	0	2.0	1.0	5.0	2.0
8	14.0	13.0	5.0	5.0	4.0	4.0	0	0	2.0	1.0	6.0	4.0
9	13.0	11.0	5.0	5.0	4.0	4.0	0	0	1.0	1.0	5.0	5.0
10	11.0	11.0	5.0	5.0	4.0	4.0	0	0	1.0	1.0	6.0	5.0
11	11.0	10.0	6.0	5.0	3.0	3.0	0	0	1.0	0	6.0	4.0
12	11.0	10.0	6.0	6.0	3.0	3.0	0	0	0	0	5.0	2.0
13	11.0	10.0	6.0	5.0	3.0	3.0	0	0	0	0	2.0	1.0
14	13.0	11.0	5.0	4.0	3.0	3.0	0	0	0	0	2.0	1.0
15	13.0	12.0	4.0	4.0	3.0	2.0	0	0	0	0	5.0	2.0
16	13.0	13.0	4.0	3.0	2.0	2.0	0	0	0	0	7.0	5.0
17	13.0	12.0	3.0	3.0	2.0	2.0	0	0	0	0	9.0	6.0
18	12.0	11.0	3.0	3.0	2.0	2.0	0	0	0	0	5.0	4.0
19	11.0	9.0	3.0	3.0	2.0	2.0	0	0	0	0	6.0	6.0
20	10.0	9.0	3.0	3.0	2.0	2.0	0	0	0	0	7.0	6.0
21	9.0	9.0	3.0	3.0	4.0	4.0	2.0	0	0	0	7.0	5.0
22	5.0	8.0	3.0	3.0	4.0	4.0	0	0	0	0	5.0	4.0
23	10.0	8.0	3.0	3.0	4.0	3.0	0	0	0	0	4.0	3.0
24	11.0	10.0	3.0	3.0	3.0	2.0	0	0	0	0	5.0	3.0
25	11.0	9.0	3.0	3.0	2.0	2.0	0	0	0	0	6.0	4.0
26	9.0	8.0	3.0	3.0	2.0	2.0	0	0	0	0	7.0	5.0
27	8.0	5.0	3.0	3.0	2.0	2.0	0	0	0	0	7.0	6.0
28	5.0	5.0	3.0	2.0	2.0	2.0	0	0	0	0	9.0	7.0
29	6.0	5.0	3.0	2.0	2.0	2.0	1.0	0	0	0	10.0	8.0
30	8.0	6.0	2.0	2.0	2.0	2.0	1.0	1.0	---	---	11.0	9.0
31	8.0	7.0	---	---	2.0	2.0	2.0	1.0	---	---	11.0	10.0
MONTH	21.0	5.0	8.0	2.0	4.0	2.0	2.0	0	2.0	0	11.0	0

04114000 GRAND RIVER AT PORTLAND, MICH.--Continued

TEMPERATURE (°C) OF WATER, OCTOBER 1967 TO JUNE 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.C	8.0	15.C	11.C	15.0	15.0	---	---	---	---	---	---
2	10.C	8.0	15.0	12.0	17.C	15.0	---	---	---	---	---	---
3	10.0	9.0	15.0	13.C	17.0	17.C	---	---	---	---	---	---
4	11.0	10.0	13.0	12.C	19.0	17.0	---	---	---	---	---	---
5	10.C	8.C	14.C	11.0	20.0	19.0	---	---	---	---	---	---
6	10.C	8.0	14.0	11.0	21.0	20.0	---	---	---	---	---	---
7	10.0	8.0	15.C	11.0	23.0	21.0	---	---	---	---	---	---
8	11.C	9.0	16.0	13.0	23.0	23.0	---	---	---	---	---	---
9	11.C	8.0	19.0	15.0	25.0	23.0	---	---	---	---	---	---
10	11.C	10.0	19.0	15.0	25.0	24.0	---	---	---	---	---	---
11	11.0	9.0	18.0	16.C	25.0	24.0	---	---	---	---	---	---
12	13.C	11.0	18.0	14.0	25.0	22.0	---	---	---	---	---	---
13	14.C	13.0	20.0	15.0	22.0	20.0	---	---	---	---	---	---
14	14.0	12.0	20.0	16.C	---	---	---	---	---	---	---	---
15	12.0	11.0	21.0	16.C	---	---	---	---	---	---	---	---
16	13.C	10.0	20.0	16.C	---	---	---	---	---	---	---	---
17	12.C	12.0	16.0	14.0	---	---	---	---	---	---	---	---
18	12.C	11.0	18.0	13.0	---	---	---	---	---	---	---	---
19	14.C	12.0	18.C	16.C	---	---	---	---	---	---	---	---
20	14.C	13.0	17.0	14.0	---	---	---	---	---	---	---	---
21	13.C	12.0	17.0	14.0	---	---	---	---	---	---	---	---
22	15.C	12.0	18.0	15.0	21.0	20.0	---	---	---	---	---	---
23	15.C	13.0	18.0	16.C	22.0	20.C	---	---	---	---	---	---
24	13.0	11.0	19.0	14.C	21.0	20.0	---	---	---	---	---	---
25	11.C	8.0	20.0	16.0	---	---	---	---	---	---	---	---
26	10.0	7.C	19.0	16.C	---	---	---	---	---	---	---	---
27	12.0	9.0	17.0	15.0	---	---	---	---	---	---	---	---
28	13.0	10.0	16.0	15.C	---	---	---	---	---	---	---	---
29	14.C	12.0	15.0	14.0	---	---	---	---	---	---	---	---
30	14.0	11.0	14.C	14.C	---	---	---	---	---	---	---	---
31	---	---	15.0	14.C	---	---	---	---	---	---	---	---
MCNTH	15.0	7.0	21.C	11.0	---	---	---	---	---	---	---	---

04121500 MUSKOGON RIVER AT EVART, MICH.

LOCATION.--Lat 43°53'55", long 85°15'20", in NW¼NE¼ sec.3, T.17 N., R.8 W., Osceola County, temperature recorder at gaging station on right bank 500 ft downstream from bridge on U. S. Highway 10 at Evart, 0.4 mile upstream from Twin Creek, and at mile 123.9.

DRAINAGE AREA.--1,450 sq mi. approximately.

PERIOD OF RECORD.--Water temperatures: November 1956 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 27.0°C Aug. 23; minimum, freezing point on many days during November to March.

Period of record:

Water temperatures: Maximum 28.5°C July 1, 1963; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	10.C	7.0	6.C	6.C	0	0	1.0	0	1.0	1.0	0	0
2	13.C	9.0	6.0	6.C	0	0	1.0	0	1.0	1.0	0	0
3	14.C	12.0	6.C	5.C	0	0	0	0	1.0	1.0	0	0
4	17.0	13.0	5.0	4.0	0	0	1.0	0	1.0	1.0	1.0	0
5	16.0	14.C	4.C	3.0	1.C	0	1.0	1.0	1.0	1.0	1.0	0
6	14.C	12.0	3.C	2.0	1.C	1.0	1.0	1.0	1.0	1.0	1.0	0
7	12.C	10.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
8	11.C	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
9	11.0	9.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
10	9.0	9.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
11	5.C	8.0	3.0	2.C	1.C	1.0	1.0	1.0	1.0	1.0	1.0	0
12	5.C	8.0	4.0	3.C	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
13	8.C	8.0	4.0	3.C	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0
14	10.0	8.0	3.0	2.C	1.0	0	1.0	0	1.0	1.0	1.0	0
15	10.0	9.0	2.C	1.0	0	0	0	0	1.0	1.0	1.0	0
16	10.C	9.0	1.C	1.C	0	0	1.0	0	1.0	1.0	1.0	0
17	10.C	9.0	1.0	1.C	0	0	1.0	1.0	1.0	1.0	1.0	0
18	8.0	8.0	2.C	1.C	0	0	1.0	1.0	1.0	1.0	1.0	0
19	8.C	7.0	2.0	2.C	1.0	0	0	0	1.0	1.0	2.0	0
20	7.C	6.0	2.C	1.0	1.C	1.0	0	0	1.0	1.0	2.0	2.0
21	7.C	6.0	1.0	1.0	2.0	1.0	1.0	0	1.0	1.0	2.0	1.0
22	7.0	6.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
23	8.C	6.0	1.0	1.0	1.C	1.0	1.0	1.0	1.0	0	1.0	1.0
24	5.C	7.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0	2.0	1.0
25	5.0	7.0	2.0	1.0	0	0	1.0	1.0	1.0	0	3.0	1.0
26	7.C	6.0	2.0	2.C	0	0	1.0	1.0	0	0	4.0	3.0
27	6.C	4.0	2.C	1.C	0	0	1.0	1.0	0	0	4.0	4.0
28	4.C	4.0	1.0	0	0	0	1.0	1.0	0	0	6.0	4.0
29	4.0	4.0	0	0	0	0	1.0	1.0	0	0	7.0	6.0
30	4.0	4.0	0	0	0	0	1.0	1.0	---	---	7.0	6.0
31	6.C	4.0	---	---	0	0	1.0	1.0	---	---	7.0	7.0
MCNTH	17.0	4.0	6.C	0	2.0	0	1.0	0	1.0	0	7.0	0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04123500 MANISTEE RIVER NEAR GRAYLING, MICH.

LOCATION.--Lat 44°41'35", long 84°50'50", in NW 1/4 sec.31, T.27 N., R.4 W., Crawford County, temperature recorder at gaging station on right bank, 25 ft upstream from bridge on State Highway 72, 2.5 miles downstream from Goose Creek, and 6.5 miles northwest of Grayling.

DRAINAGE AREA.--159 sq mi.

PERIOD OF RECORD.--Water temperatures: May 1957 to September 1968.

EXTREMES.--1947-68:

Water temperatures: Maximum, 23.0°C July 15, 16; minimum, freezing point on several days during December to March.

Period of record:

Water temperatures: Maximum, 24.5°C July 1, 1963; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

Table with columns for months (OCTOBER to SEPTEMBER) and days (1-31). Rows show MAX and MIN temperatures for each day. Summary rows (MCNTH) show monthly averages for MAX and MIN.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125200 PINE RIVER NEAR LUTHER, MICH.

LOCATION.--Lat 44°06'46", long 85°41'00", NE½SE½NE½ sec.24, T.20 N., R.12 W., Lake County, at Walker Bridge, 5 miles north of Luther.

PERIOD OF RECORD.--Sediment records: December 1966 to September 1968.

EXTREMES.--1967-68:

Sediment concentrations: Maximum daily, 412 mg/l Feb. 5; minimum daily, 1 mg/l Oct. 4, 1967.
Sediment loads: Maximum daily, 348 tons Feb. 2; minimum daily, 0.3 ton (estimated) Oct. 6,7.

Period of record:

Sediment concentrations: Maximum daily, 412 mg/l Feb. 5, 1968; minimum daily, 1 mg/l Oct. 4, 1967.
Sediment loads: Maximum daily, 653 tons Dec. 9, 1966; minimum daily, 0.3 ton (estimated) Oct. 6,7, 1967.

REMARKS.--Data analyzed and compiled by the Forest Service, U.S. Dept. of Agriculture, North Central Forest Experiment Station, Cadillac, Michigan.

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	154	30		206	46	26	158	11	4.7
2	142	10	3.8	317	68	58	162	11	4.8
3	134	1	.40	322	67	58	154	11	4.5
4	134	1	.40	264	57	41	154	11	4.6
5	130	1	.40	222	48	29	162	11	4.8
6	126	1	.30	198	98	52	166	15	6.7
7	126	1	.30	182	98	48	182	23	11
8	130	1	.40	174	98	46	218	65	38
9	142	16	6.1	174	98	46	206	43	24
10	154	26	11	174	98	46	185	33	17
11	154	26	11	238	150	96	182	23	11
12	146	19	7.5	269	170	73	377	182	15
13	142	16	6.1	234	50	32	408	138	152
14	162	35	15	214	36	21	269	37	27
15	158	30	13	252	34	20	214	22	13
16	174	40	19	198	25	13	186	22	11
17	186	60	30	182	20	9.8	174	40	19
18	162	35	15	198	25	13	174	40	19
19	156	24	17	214	36	21	182	40	20
20	146	15	5.9	194	25	13	173	40	19
21	142	10	3.8	178	25	12	194	40	21
22	138	2	.70	174	25	12	333	117	105
23	138	2	.70	174	25	12	260	50	45
24	138	2	.70	170	25	11	222	41	25
25	150	12	4.9	174	25	12	272	36	20
26	162	25	11	206	45	25	178	31	15
27	158	20	8.6	210	47	26	172	31	14
28	154	17	7.1	178	40	19	160	31	14
29	150	12	4.9	174	27	13	154	31	13
30	150	12	4.9	170	15	6.9	150	31	13
31	182	42	21	--	--	--	146	31	12
TOTAL	4618	--	242.90	6184	--	--	6193	--	713.2

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	146	31	12	307	100	83	138	6	2.2
2	146	33	13	565	228	348	138	12	4.5
3	146	33	13	397	80	86	138	12	4.5
4	146	33	13	322	69	60	138	12	4.5
5	146	33	13	278	412	309	138	12	4.5
6	146	33	13	255	64	44	138	12	4.5
7	146	33	13	234	59	37	138	12	4.5
8	146	33	13	210	51	29	142	12	4.5
9	146	33	13	194	43	23	198	36	19
10	146	33	13	178	35	17	242	60	33
11	146	33	13	170	27	12	222	50	30
12	146	33	13	166	19	8.5	218	55	32
13	146	33	13	158	11	4.7	202	45	25
14	146	33	13	158	11	4.7	166	33	15
15	146	6	2.4	154	10	4.2	170	35	16
16	146	6	2.4	150	9	3.7	214	48	28
17	146	6	2.4	150	8	3.2	269	65	47
18	146	6	2.4	146	7	2.8	297	75	60
19	146	6	2.4	140	6	2.3	371	96	96
20	150	6	2.4	134	5	1.8	422	120	137
21	150	28	13	134	5	1.8	322	75	65
22	150	28	13	134	5	1.8	238	45	289
23	150	28	13	134	5	1.8	202	45	25
24	150	28	13	130	5	1.8	194	70	37
25	150	28	13	130	5	2.1	198	70	37
26	146	28	11	134	6	2.2	214	70	40
27	138	28	10	134	6	2.2	234	30	19
28	146	28	11	138	6	2.2	242	30	20
29	106	35	16	138	6	2.2	246	30	20
30	218	117	69	--	--	--	726	30	18
31	214	80	46	--	--	--	225	30	18
TOTAL	4702	--	423.4	5672	--	1102.0	5641	--	1165.8

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04125450 PINE RIVER NEAR DUBLIN, MICH.

LOCATION.--Lat 44°10'45", long 85°45'40", SE 1/4 sec.28, T.21 N., R.12 W., Wexford County, at County bridge 2.5 miles southwest of Hoxeyville.

PERIOD OF RECORD.--Sediment records: November 1967 to September 1968.

EXTREMES.--November 1967 to September 1968:

Sediment concentrations: Maximum daily, 467 mg/l Feb. 5; minimum daily, 7 mg/l May 23-27.

Sediment loads: Maximum daily, 662 tons Feb. 2; minimum daily, 3.8 tons (estimated) May 25-26.

REMARKS.--Data analyzed and compiled by the Forest Service, U.S. Department of Agriculture, North Central Experiment Station, Cadillac, Michigan.

SUSPENDED SEDIMENT, NOVEMBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1				--	--	--	244	24	10
2				--	--	--	241	24	18
3				--	--	--	241	24	15
4				--	--	--	238	34	22
5				--	--	--	238	34	22
6				--	--	--	241	34	22
7				--	--	--	243	34	24
8				--	--	--	293	50	39
9				--	--	--	283	34	26
10				--	--	--	260	34	24
11				--	--	--	267	34	24
12				--	--	--	385	115	119
13				--	--	--	467	300	378
14				--	--	--	383	141	146
15				--	--	--	327	90	79
16				--	--	--	277	70	52
17				--	--	--	257	50	34
18				--	--	--	255	37	25
19				--	--	--	257	37	26
20				--	--	--	258	37	26
21				--	--	--	293	80	63
22				258	32	22	405	160	175
23				255	32	22	371	140	140
24				252	32	22	321	100	87
25				255	32	22	293	36	28
26				285	32	25	264	36	26
27				302	60	41	249	36	24
28				272	32	23	240	36	23
29				260	24	17	235	36	23
30				255	24	16	230	36	22
31				--	--	--	227	36	22
TOTAL				2394	--	210	8799	--	1769

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	227	17	10	383	174	180	210	18	10
2	227	17	10	657	373	562	221	16	9.5
3	227	17	10	530	187	267	213	16	9.2
4	227	17	10	425	150	172	216	16	9.3
5	227	17	10	369	467	465	218	16	9.4
6	227	17	10	346	122	114	218	16	9.4
7	227	70	43	341	122	112	216	16	9.3
8	227	70	43	313	122	103	219	16	9.4
9	227	70	43	296	122	97	263	55	39
10	227	70	43	274	127	94	335	110	99
11	227	70	43	260	127	92	327	100	88
12	227	70	43	258	127	88	318	288	247
13	227	70	43	250	127	86	274	60	44
14	227	70	43	246	118	78	272	60	44
15	227	13	8.0	241	107	70	260	50	35
16	210	13	7.4	238	99	64	302	80	65
17	227	13	8.0	224	67	41	380	140	144
18	224	13	7.9	218	54	32	408	173	190
19	227	13	8.0	214	45	26	480	220	285
20	230	13	8.1	210	36	20	530	199	285
21	227	61	37	210	36	20	461	190	236
22	224	61	37	210	36	20	352	186	177
23	230	61	38	210	36	20	313	100	84
24	230	61	38	210	36	20	285	51	39
25	235	61	39	210	18	10	285	51	39
26	227	61	36	210	18	10	307	80	65
27	221	61	36	210	18	10	329	110	98
28	227	61	37	218	18	11	338	130	119
29	244	100	66	218	18	11	357	130	125
30	293	149	118	--	--	--	327	110	98
31	296	98	78	--	--	--	318	100	86
TOTAL	7171	--	1011.4	8208	--	2995	9546	--	2806.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125450 PINE RIVER NEAR DUBLIN, MICH.--Continued

SUSPENDED SEDIMENT, NOVEMBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	355		96	241	47	31	255	50	34
2	315	9C	76	227	44	27	260	50	35
3	291	80	63	221	42	25	249	46	31
4	315	9C	76	218	41	24	224	30	18
5	357	10C	96	216	40	23	210	20	11
6	315	9C	76	213	39	22	199	10	5.4
7	288	71	55	210	33	19	196	10	5.3
8	271	71	53	207	27	15	193	10	5.2
9	272	71	52	204	21	12	204	23	13
10	263	71	50	202	17	9.3	199	23	12
11	255	71	48	199	15	9.1	199	23	12
12	252	31	21	196	10	5.3	202	23	12
13	246	31	21	199	15	9.0	199	23	12
14	249	31	21	202	15	8.2	196	23	12
15	269	31	22	224	20	12	190	23	12
16	277	31	24	232	30	19	185	23	11
17	274	31	23	258	50	35	176	23	11
18	280	31	25	244	40	26	190	30	15
19	274	22	16	230	30	19	238	48	31
20	266	22	16	252	40	27	213	38	22
21	283	22	17	238	30	19	196	28	8.0
22	288	22	17	224	20	12	193	28	8.0
23	288	22	17	218	7	4.1	193	28	8.0
24	327	10C	88	213	7	4.0	207	28	8.1
25	355	132	126	202	7	3.8	260	50	35
26	329	10C	89	199	7	3.8	355	106	102
27	302	80	65	235	7	4.4	458	213	263
28	274	6.0	44	338	110	100	537	291	422
29	258	50	35	369	144	143	453	200	245
30	252	48	33	321	100	87	349	120	113
31	--	--	--	277	59	44	--	--	--
TOTAL	8540	--	1461	7229	--	800.0	7378	--	1532.0
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	302	11C	90	196	11	5.8	193	23	5.8
2	255	50	34	190	13	6.7	246	40	27
3	232	4C	25	185	13	6.5	269	37	27
4	218	20	12	179	13	6.3	227	25	15
5	204	20	11	174	13	6.1	224	20	12
6	199	18	9.7	176	13	6.2	216	16	9.3
7	196	18	9.5	193	13	6.8	204	16	8.8
8	196	18	9.5	216	20	12	213	16	9.2
9	196	18	9.5	190	18	9.2	218	16	9.4
10	193	18	9.4	182	18	8.8	245	16	10
11	188	14	8.1	179	18	8.7	252	16	10
12	182	14	6.9	193	18	9.4	249	16	10
13	179	12	5.8	193	18	9.4	224	36	22
14	176	10	4.8	193	18	9.4	215	36	21
15	176	10	4.8	190	14	7.2	204	36	20
16	174	10	4.7	196	14	7.2	199	36	19
17	174	10	4.7	213	14	8.1	196	36	19
18	193	10	5.2	238	14	8.9	213	36	20
19	244	40	26	221	14	8.4	232	36	23
20	216	20	12	218	14	8.2	246	19	13
21	196	13	6.9	202	14	7.6	230	19	12
22	190	13	6.7	196	23	12	221	19	11
23	182	13	6.4	196	23	12	216	19	11
24	182	13	6.4	190	23	12	318	204	175
25	179	13	6.3	188	23	12	402	160	174
26	176	11	5.2	190	23	12	327	100	88
27	196	11	5.8	188	23	12	280	70	53
28	213	11	6.3	188	23	12	255	50	34
29	196	11	5.8	188	23	12	241	30	20
30	190	11	5.6	188	23	12	227	20	12
31	193	11	5.7	185	23	11	--	--	--
TOTAL	6186	--	369.7	6014	--	285.9	7201	--	902.8
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)									78766
TOTAL LOAD FOR YEAR (TONS)									14143.3

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125510 PINE RIVER NEAR WELLSTON, MICH.

LOCATION.--Lat 44°12'47", long 85°53'47", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.16, T.21 N., R.13 W., Manistee County, at Stronach Dam, 3 miles east of Wellston.

PERIOD OF RECORD.--Sediment records: October 1966 to September 1968.

EXTREMES.--1967-68:

Sediment concentrations: Maximum daily, 469 mg/l Feb. 2; minimum daily 37 mg/l Jan. 9-20.

Sediment loads: Maximum daily, 997 tons Feb.2; minimum daily 30 tons Jan. 18 and 30 tons (estimated) on many days in January.

Period of record:

Sediment concentrations: Maximum daily, 710 mg/l Dec. 9, 1966; minimum daily, 37 mg/l Jan. 18, 1968.

Sediment loads: Maximum daily, 2389 tons Dec. 9, 1966, minimum daily, 30 tons Jan. 18, 1968 and 30 tons (estimated) on many days in Jan. 1968.

REMARKS.--Data analyzed and compiled by the Forest Service, U.S. Dept. of Agriculture, North Central Forest Experiment Station, Cadillac, Michigan.

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	314	116	98	381	100	103	322	52	45
2	297	116	93	480	182	236	314	50	42
3	282	116	88	556	182	273	314	50	42
4	282	116	88	491	152	201	314	50	42
5	274	116	86	443	132	157	314	50	42
6	274	116	86	391	110	116	314	50	42
7	266	87	62	355	100	96	339	60	51
8	274	87	64	347	80	75	381	76	78
9	289	87	68	347	80	75	391	76	80
10	297	87	70	347	80	75	364	70	69
11	297	87	70	411	126	140	355	52	59
12	297	87	70	491	170	225	491	125	166
13	289	85	66	450	150	182	612	222	367
14	305	85	70	411	108	120	523	163	230
15	322	85	74	381	68	70	411	113	125
16	330	85	76	372	55	55	364	113	113
17	339	80	80	355	39	37	339	132	121
18	330	85	76	372	39	39	339	132	121
19	314	75	64	401	92	100	339	132	121
20	305	69	57	381	66	68	339	132	121
21	297	64	51	347	39	36	364	150	147
22	289	58	45	339	39	36	513	176	244
23	282	58	44	339	39	36	532	196	211
24	289	58	45	330	39	35	430	110	128
25	305	58	48	330	39	35	391	92	97
26	322	58	50	364	70	69	364	80	78
27	322	58	50	391	120	127	339	67	61
28	322	60	52	364	70	67	330	67	63
29	314	60	51	330	54	48	320	67	58
30	314	60	51	322	54	47	310	67	56
31	339	60	55	--	--	--	305	67	55
TOTAL	9372	--	2048	11607	--	2979	11647	--	3270
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	305	143	118	502	131	178	282	47	36
2	305	143	118	587	469	997	282	85	65
3	305	143	118	704	320	608	282	85	65
4	305	143	118	513	200	277	282	85	65
5	305	143	118	480	170	220	289	85	66
6	305	143	118	440	156	185	289	85	66
7	305	143	118	430	116	135	282	85	65
8	305	143	118	401	108	117	289	85	66
9	305	37	30	372	81	81	322	85	74
10	305	37	30	355	56	54	411	93	103
11	305	37	30	347	56	52	430	99	115
12	305	37	30	339	56	51	440	99	118
13	305	37	30	330	56	50	372	89	89
14	305	37	30	330	56	50	347	85	80
15	305	37	30	330	56	50	339	85	78
16	305	37	30	322	56	49	381	89	92
17	305	37	30	314	56	47	480	145	188
18	305	37	30	297	60	48	565	186	71
19	305	37	30	289	60	47	612	237	392
20	305	37	30	274	60	44	669	252	455
21	305	48	39	274	60	44	623	224	377
22	305	48	39	274	60	44	491	142	188
23	305	48	39	274	60	44	430	96	111
24	305	48	39	274	60	44	274	89	92
25	305	48	39	282	47	36	391	89	94
26	305	48	39	282	47	36	391	98	103
27	297	48	38	282	47	36	430	115	133
28	305	48	39	282	47	36	459	130	158
29	330	72	64	282	47	36	480	150	194
30	401	138	149	--	--	--	440	130	154
31	401	138	149	--	--	--	430	114	132
TOTAL	9664	--	1977	10462	--	3696	12562	--	4085

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125510 PINE RIVER NEAR WELLSTON, MICH.--Continued

SUPFNDSED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	480	146	189	330	63	56	364	98	96
2	440	116	138	330	63	56	364	98	96
3	401	81	88	322	82	71	347	98	92
4	411	104	115	322	82	71	330	98	87
5	460	146	181	314	82	69	305	98	81
6	440	116	138	314	82	69	297	98	79
7	391	72	76	305	82	67	289	112	87
8	372	59	32	305	82	67	289	112	87
9	364	59	58	305	76	63	297	112	90
10	339	59	34	297	76	61	297	112	90
11	330	59	53	297	70	56	305	112	92
12	314	108	92	297	70	56	322	112	97
13	297	108	87	289	64	50	305	112	92
14	297	108	87	297	64	51	297	133	107
15	339	108	99	314	72	61	289	133	104
16	355	108	103	330	90	80	289	133	104
17	339	108	99	347	94	80	282	133	101
18	339	108	99	339	100	91	289	133	104
19	330	82	73	330	90	80	330	182	162
20	330	82	73	355	106	102	322	182	158
21	347	82	77	339	100	91	297	182	146
22	355	82	79	330	84	75	289	182	142
23	355	82	79	322	75	65	289	182	142
24	411	136	151	314	70	59	289	182	142
25	470	180	228	297	48	38	322	200	174
26	450	160	194	297	48	38	430	268	311
27	411	136	151	339	73	67	534	244	352
28	372	100	100	421	170	193	646	294	513
29	355	63	60	480	185	240	589	180	286
30	339	63	58	440	132	157	670	150	190
31	--	--	--	381	98	101	--	--	--
TOTAL	11233	--	3111	10299	--	2495	10364	--	4404
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	381	123	127	250	77	52	234	114	72
2	339	115	105	242	156	102	265	114	82
3	322	110	96	234	156	99	305	114	94
4	305	107	88	234	156	99	282	114	87
5	291	104	83	234	156	99	274	114	84
6	289	102	80	234	156	99	266	114	82
7	274	100	74	250	314	212	250	145	98
8	274	100	74	266	314	226	258	145	101
9	282	100	76	250	174	117	270	145	105
10	274	100	74	242	174	114	293	145	115
11	266	104	72	234	174	110	299	145	113
12	266	104	75	234	174	110	301	145	118
13	266	104	75	234	174	110	278	170	128
14	266	104	75	234	174	110	266	170	122
15	258	104	72	234	443	280	250	170	115
16	258	104	72	234	443	280	246	170	113
17	258	104	72	250	443	300	250	170	115
18	274	104	77	266	443	318	254	170	117
19	305	106	87	258	272	189	278	170	128
20	305	106	87	250	272	184	293	128	101
21	274	106	78	250	272	184	282	128	97
22	258	106	74	242	272	178	270	128	93
23	250	106	72	242	272	172	254	128	88
24	250	106	72	234	272	172	343	158	146
25	242	106	69	242	272	178	440	195	232
26	242	77	50	234	272	172	425	148	170
27	258	77	54	226	272	166	359	118	118
28	274	77	57	226	272	166	326	102	102
29	266	77	55	226	272	166	305	92	76
30	250	77	52	226	114	70	289	87	68
31	250	77	52	226	114	70	--	--	--
TOTAL	8567	--	2326	7438	--	4904	8696	--	3281
TOTAL DISCHARGE FOR YEAR (CFS).									121911
TOTAL LOAD FOR YEAR (TONS).									38576

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04125510 PINE RIVER NEAR WELLSTON, MICH.--Continued

PERIODIC DETERMINATIONS OF TOTAL-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OF COLLECTION	TIME (24 HOUR)	DISCHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	DISSOLVED SOLIDS CONCEN- TRATION (MG/L)	TOTAL SEDIMENT (METHOD, SIEVE)								
					PERCENT FINER THAN SIZE INDICATED, IN MILLIMETERS								
					.063	.125	.250	.500	1.000	2.000			
OCT. 4, 1967.....	1015	282	116	229	20	--	--	--	--	--			
OCT. 9.....	1015	289	87	224	23	--	--	--	--	--			
OCT. 16.....	1030	322	85	215	19	--	--	--	--	--			
OCT. 24.....	1020	297	58	234	10	--	--	--	--	--			
OCT. 31.....	1130	347	60	E205	7	15	43	100	--	--			
NOV. 3.....	1615	556	182	E163	24	29	64	94	98	100			
NOV. 7.....	0905	372	100	E197	26	--	--	--	--	--			
NOV. 13.....	1450	450	150	187	13	18	54	96	99	100			
NOV. 14.....	1320	421	108	E184	14	--	--	--	--	--			
NOV. 21.....	0830	364	29	E200	28	--	--	--	--	--			
NOV. 28.....	0950	364	70	193	21	--	--	--	--	--			
DEC. 5.....	0830	322	50	E215	26	--	--	--	--	--			
DEC. 12.....	1020	421	97	E185	16	--	--	--	--	--			
DEC. 12.....	1430	470	154	E174	22	28	49	95	100	--			
DEC. 13.....	1135	634	210	E155	36	--	--	--	--	--			
DEC. 13.....	1700	623	235	E157	26	34	63	95	100	--			
DEC. 14.....	0915	523	163	E166	21	--	--	--	--	--			
DEC. 15.....	1330	421	113	E185	19	--	--	--	--	--			
DEC. 18.....	1200	339	132	E208	24	--	--	--	--	--			
DEC. 27.....	1155	339	67	E207	30	--	--	--	--	--			
JAN. 2, 1968.....	1700	305	143	E199	11	--	--	--	--	--			
JAN. 18.....	1115	297	37	E222	24	--	--	--	--	--			
JAN. 23.....	1215	314	48	E216	25	--	--	--	--	--			
JAN. 30.....	0930	381	138	E194	25	--	--	--	--	--			
FEB. 1.....	1000	450	131	E180	31	--	--	--	--	--			
FEB. 2.....	1200	799	469	E143	34	--	--	--	--	--			
FEB. 6.....	1300	480	156	E173	13	--	--	--	--	--			
FEB. 13.....	1415	339	56	E182	20	--	--	--	--	--			
FEB. 21.....	1300	266	60	E240	12	--	--	--	--	--			
FEB. 27.....	1200	282	47	E229	17	--	--	--	--	--			
MAR. 5.....	1300	289	85	E228	26	--	--	--	--	--			
MAR. 12.....	1140	421	99	E184	22	--	--	--	--	--			
MAR. 18.....	1100	523	186	E167	32	--	--	--	--	--			
MAR. 19.....	1220	589	237	E160	29	--	--	--	--	--			
MAR. 20.....	1440	669	282	E152	33	--	--	--	--	--			
MAR. 22.....	1230	480	142	164	25	--	--	--	--	--			
MAR. 25.....	1130	381	89	E192	22	--	--	--	--	--			
APR. 1.....	1045	460	146	E177	14	--	--	--	--	--			
APR. 8.....	1100	372	59	E196	29	--	--	--	--	--			
APR. 15.....	1140	347	108	E206	30	--	--	--	--	--			
APR. 22.....	1140	355	82	E202	21	--	--	--	--	--			
APR. 29.....	1120	355	63	E202	37	--	--	--	--	--			
MAY 6.....	1105	305	82	E222	20	--	--	--	--	--			
MAY 13.....	1105	297	64	E226	45	--	--	--	--	--			
MAY 20.....	1105	347	106	E205	35	--	--	--	--	--			
MAY 27.....	1210	314	73	E215	22	--	--	--	--	--			
JUNE 3.....	1125	355	98	E203	20	--	--	--	--	--			
JUNE 10.....	1125	297	112	E222	25	--	--	--	--	--			
JUNE 17.....	1135	282	133	E232	27	--	--	--	--	--			
JUNE 24.....	1140	297	182	E226	15	--	--	--	--	--			
JUNE 26.....	1210	430	281	188	34	--	--	--	--	--			
JUNE 26.....	1530	440	255	E180	33	--	--	--	--	--			
JUNE 27.....	0955	513	248	E168	28	--	--	--	--	--			
JUNE 27.....	1400	545	240	E164	28	--	--	--	--	--			
JUNE 28.....	1145	634	294	164	34	--	--	--	--	--			
JULY 1.....	1230	391	123	E190	42	--	--	--	--	--			
JULY 8.....	1125	282	100	E201	30	--	--	--	--	--			
JULY 15.....	1430	266	104	E240	10	--	--	--	--	--			
JULY 22.....	1050	266	106	235	13	--	--	--	--	--			
JULY 29.....	1100	266	77	E240	27	--	--	--	--	--			
AUG. 5.....	1120	234	156	E240	13	--	--	--	--	--			
AUG. 8.....	0940	258	314	E240	9	--	--	--	--	--			
AUG. 12.....	1130	234	174	E240	17	--	--	--	--	--			
AUG. 16.....	1405	234	443	240	12	--	--	--	--	--			
AUG. 26.....	1150	234	272	E240	8	--	--	--	--	--			
SEPT. 3.....	1145	318	114	E215	26	--	--	--	--	--			
SEPT. 9.....	1105	262	145	E242	25	--	--	--	--	--			
SEPT. 16.....	1145	254	170	E246	14	--	--	--	--	--			
SEPT. 23.....	1040	266	128	E240	16	--	--	--	--	--			
SEPT. 30.....	1500	297	87	E224	24	--	--	--	--	--			

E ESTIMATED.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04127800 JORDAN RIVER NEAR EAST JORDAN, MICH.

LOCATION.--Lat 45°06'08", long 85°05'53", in NW¼NW¼ sec.7, T.31 N., R.6 W., Charlevoix County, temperature recorder at gaging station on right bank, 600 ft downstream from Webster Bridge, and 4.2 miles south of East Jordan.

DRAINAGE AREA.--67.6 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1966 to September 1968.

EXTREMES.--1966-68:
Water temperatures: Maximum, 19.0°C July 15-17; minimum freezing point on many days during February and March.

Period of record:
Water temperatures: Maximum, 19.0°C July 15-17, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Sept. 13-16; range in temperature, 12.0°C to 13.0°C.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

MONTH	DAY																															AVER- AGE	
	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		
OCTOBER																																	
MAXIMUM	11	12	12	13	13	11	9	9	9	8	8	7	7	8	9	9	9	8	8	6	6	6	8	9	9	7	6	6	5	5	6	8	
MINIMUM	8	11	12	12	11	9	8	8	8	8	7	7	7	8	9	7	8	6	5	6	5	6	8	7	6	6	5	4	4	5	7		
NOVEMBER	6	6	5	3	2	2	2	3	3	3	4	4	3	2	1	2	2	2	2	2	2	2	2	2	2	3	3	1	1	1	--	3	
MINIMUM	6	6	5	3	2	2	2	2	2	2	3	3	3	2	1	1	1	2	2	2	2	2	2	2	2	2	3	1	1	1	--	2	
DECEMBER	1	1	2	2	2	3	3	3	3	2	2	2	2	3	2	2	3	3	3	3	4	4	2	2	2	2	1	1	1	1	2		
MINIMUM	1	1	1	2	2	2	3	3	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	1	1	1	1	1	2		
JANUARY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	1		
MINIMUM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	2	2	2	1		
FEBRUARY	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	--	0	
MINIMUM	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	--	0	
MARCH	1	1	1	2	2	2	2	3	3	3	3	2	1	1	3	4	4	4	3	3	3	3	2	2	2	3	4	5	7	8	8	7	3
MINIMUM	0	0	1	2	1	1	2	3	3	2	1	1	1	1	3	3	3	3	3	3	3	2	2	2	2	3	4	5	7	7	6	5	3
APRIL	6	7	7	6	6	8	8	8	8	8	9	12	12	11	10	10	10	10	10	10	10	11	11	9	6	6	8	9	9	10	--	9	
MINIMUM	4	4	6	6	4	4	6	8	7	7	6	8	11	10	8	8	9	9	8	9	9	8	9	8	9	6	4	4	5	6	8	--	7
MAY	10	10	9	8	9	9	9	12	12	11	11	11	12	12	15	15	12	12	12	11	11	11	12	13	13	13	11	10	9	9	13	11	
MINIMUM	7	7	7	7	6	6	7	9	11	8	8	9	10	12	11	12	10	9	10	9	9	11	9	11	11	10	9	9	9	9	9	9	
JUNE	13	12	13	14	17	17	18	18	18	18	18	17	13	13	13	14	14	12	14	14	13	14	14	15	15	13	12	12	13	14	--	15	
MINIMUM	11	11	11	11	13	15	16	16	16	16	16	12	10	12	11	11	12	11	11	11	11	12	12	13	13	13	12	12	11	11	13	--	13
JULY	17	17	14	13	14	14	14	19	19	17	16	16	16	18	19	19	19	18	16	16	16	16	16	16	16	16	14	14	14	14	15	16	
MINIMUM	14	14	11	12	12	12	13	14	17	13	13	14	16	16	16	17	17	16	14	14	14	15	13	13	13	13	14	12	12	12	14	14	
AUGUST	16	16	17	18	18	18	18	16	16	14	14	16	16	15	16	16	15	15	18	18	17	18	19	18	14	12	13	13	13	13	13	16	
MINIMUM	13	13	14	16	16	16	16	16	13	12	12	13	14	12	14	15	12	13	15	15	15	16	16	14	12	11	11	11	11	12	14		
SEPTEMBER	13	13	14	14	14	12	13	13	12	12	--	--	--	--	--	14	14	14	14	13	13	14	14	14	14	11	11	10	9	11	--	13	
MINIMUM	13	12	12	13	14	12	11	12	13	12	12	11	--	--	--	13	14	14	13	11	11	12	14	14	11	11	10	9	9	9	--	12	

04128000 STURGEON RIVER NEAR WOLVERINE, MICH.

LOCATION.--Lat 45°17'55", long 84°36'40", in SE $\frac{1}{4}$ sec. 36, T.34 N., R.3 W., Cheboygan County, temperature recorder at gaging station on left bank, 1.8 miles north of Wolverine, 2.8 miles downstream from West Branch, and 9 miles upstream from mouth.

DRAINAGE AREA.--170 sq mi., approximately.

PERIOD OF RECORD.--Water temperatures: October 1958 to September 1968.

Extremes.--1967-68:

Water temperatures: Maximum, 22.0°C July 16, 17; minimum, freezing point on many days during January to March.

Period of record:

Water temperatures: Maximum, 24.0°C June 30, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Jan. 21 to Feb. 14, range in temperature, 0.0°C to 2.0°C. No temperature record Aug. 24 to Sept. 3, Sept. 12-17. Intermittent regulation at low flow from ponds, 2.4 miles upstream.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	11.0	8.0	7.0	7.0	3.0	3.0	1.0	1.0	---	---	0	0
2	12.0	10.0	7.0	7.0	3.0	3.0	1.0	1.0	---	---	0	0
3	13.0	12.0	7.0	6.0	3.0	3.0	1.0	1.0	---	---	0	0
4	14.0	12.0	6.0	6.0	3.0	3.0	1.0	1.0	---	---	0	0
5	13.0	11.0	6.0	4.0	3.0	3.0	1.0	1.0	---	---	1.0	0
6	11.0	10.0	4.0	4.0	3.0	3.0	1.0	0	---	---	1.0	1.0
7	10.0	9.0	4.0	4.0	4.0	3.0	0	0	---	---	1.0	1.0
8	9.0	9.0	4.0	4.0	4.0	3.0	0	0	---	---	2.0	1.0
9	9.0	9.0	5.0	4.0	3.0	3.0	0	0	---	---	2.0	2.0
10	9.0	8.0	6.0	5.0	3.0	2.0	0	0	---	---	3.0	2.0
11	8.0	8.0	7.0	6.0	3.0	2.0	0	0	---	---	3.0	2.0
12	8.0	8.0	7.0	6.0	3.0	3.0	0	0	---	---	2.0	1.0
13	8.0	8.0	6.0	5.0	3.0	3.0	0	0	---	---	1.0	1.0
14	9.0	8.0	5.0	4.0	3.0	2.0	0	0	---	---	1.0	0
15	9.0	9.0	4.0	4.0	3.0	2.0	0	0	0	0	3.0	0
16	10.0	9.0	4.0	4.0	2.0	2.0	0	0	0	0	4.0	2.0
17	9.0	9.0	4.0	4.0	2.0	2.0	0	0	0	0	4.0	2.0
18	8.0	8.0	4.0	4.0	3.0	2.0	0	0	0	0	4.0	2.0
19	8.0	8.0	4.0	4.0	3.0	3.0	0	0	0	0	3.0	2.0
20	8.0	7.0	4.0	4.0	3.0	2.0	0	0	0	0	2.0	2.0
21	7.0	7.0	4.0	4.0	4.0	2.0	---	---	0	0	2.0	2.0
22	7.0	7.0	4.0	4.0	4.0	2.0	---	---	0	0	2.0	1.0
23	9.0	7.0	4.0	4.0	2.0	2.0	---	---	0	0	2.0	2.0
24	11.0	9.0	4.0	4.0	2.0	1.0	---	---	0	0	4.0	2.0
25	11.0	9.0	4.0	4.0	1.0	1.0	---	---	0	0	4.0	2.0
26	9.0	7.0	4.0	4.0	1.0	1.0	---	---	0	0	6.0	4.0
27	7.0	7.0	4.0	4.0	1.0	1.0	---	---	0	0	6.0	4.0
28	7.0	7.0	4.0	3.0	1.0	1.0	---	---	0	0	7.0	6.0
29	7.0	7.0	3.0	3.0	1.0	1.0	---	---	0	0	7.0	6.0
30	7.0	7.0	3.0	3.0	1.0	1.0	---	---	---	---	7.0	5.0
31	7.0	7.0	---	---	1.0	1.0	---	---	---	---	7.0	6.0
MCNTH	14.0	7.0	7.0	3.0	4.0	1.0	---	---	---	---	7.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	7.0	4.0	11.0	8.0	14.0	12.0	18.0	16.0	17.0	14.0	---	---
2	7.0	5.0	11.0	8.0	13.0	11.0	18.0	14.0	17.0	14.0	---	---
3	7.0	5.0	10.0	8.0	15.0	11.0	16.0	12.0	19.0	15.0	---	---
4	7.0	6.0	8.0	7.0	16.0	12.0	15.0	13.0	19.0	16.0	17.0	14.0
5	6.0	4.0	10.0	7.0	19.0	14.0	16.0	13.0	19.0	17.0	17.0	16.0
6	7.0	4.0	11.0	7.0	20.0	16.0	16.0	13.0	19.0	17.0	16.0	13.0
7	8.0	5.0	11.0	7.0	20.0	17.0	17.0	14.0	19.0	17.0	14.0	12.0
8	8.0	7.0	13.0	8.0	21.0	17.0	19.0	15.0	19.0	17.0	14.0	13.0
9	8.0	7.0	13.0	11.0	20.0	17.0	19.0	17.0	17.0	16.0	14.0	13.0
10	8.0	7.0	12.0	8.0	19.0	17.0	17.0	13.0	17.0	14.0	14.0	13.0
11	9.0	6.0	12.0	9.0	19.0	16.0	17.0	13.0	16.0	14.0	14.0	12.0
12	12.0	8.0	12.0	9.0	18.0	14.0	17.0	14.0	15.0	14.0	---	---
13	12.0	11.0	13.0	9.0	15.0	12.0	16.0	15.0	18.0	14.0	---	---
14	11.0	10.0	13.0	11.0	15.0	13.0	19.0	17.0	18.0	15.0	---	---
15	10.0	7.0	16.0	11.0	15.0	12.0	21.0	18.0	17.0	14.0	---	---
16	10.0	7.0	16.0	13.0	16.0	12.0	22.0	18.0	18.0	16.0	---	---
17	10.0	9.0	13.0	10.0	15.0	12.0	22.0	19.0	18.0	17.0	---	---
18	9.0	9.0	13.0	10.0	13.0	12.0	21.0	18.0	18.0	17.0	17.0	14.0
19	12.0	8.0	12.0	10.0	16.0	12.0	19.0	17.0	17.0	15.0	16.0	15.0
20	11.0	9.0	11.0	10.0	15.0	12.0	19.0	16.0	19.0	17.0	15.0	14.0
21	11.0	9.0	12.0	9.0	15.0	12.0	19.0	16.0	19.0	16.0	14.0	12.0
22	12.0	9.0	12.0	9.0	16.0	12.0	19.0	17.0	18.0	16.0	14.0	13.0
23	11.0	9.0	12.0	10.0	16.0	13.0	18.0	16.0	19.0	16.0	16.0	14.0
24	10.0	8.0	14.0	9.0	16.0	13.0	18.0	15.0	---	---	16.0	15.0
25	8.0	6.0	14.0	10.0	16.0	13.0	18.0	15.0	---	---	15.0	12.0
26	8.0	6.0	13.0	11.0	13.0	12.0	18.0	15.0	---	---	12.0	11.0
27	10.0	6.0	11.0	10.0	12.0	12.0	18.0	16.0	---	---	11.0	11.0
28	11.0	7.0	10.0	9.0	12.0	12.0	17.0	14.0	---	---	11.0	10.0
29	11.0	8.0	10.0	9.0	15.0	11.0	16.0	14.0	---	---	11.0	10.0
30	12.0	8.0	10.0	9.0	16.0	14.0	16.0	14.0	---	---	13.0	11.0
31	---	---	14.0	9.0	---	---	17.0	15.0	---	---	---	---
MCNTH	12.0	4.0	16.0	7.0	21.0	11.0	22.0	12.0	---	---	---	---

STREAMS TRIBUTARY TO LAKE HURON

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04135700 SOUTH BRANCH AU SABLE RIVER NEAR LUZERNE, MICH.

LOCATION.--Lat 44°36'53", long 84°27'20", in SE $\frac{1}{4}$ sec.29, T.26 N., R.1 W., Oscoda County, temperature recorder at gaging station on right bank, 10 ft upstream from Smith Bridge, 400 miles downstream from highway bridge on State Highway 72, 4.6 miles upstream from mouth, and 9.1 miles west of Luzerne.

DRAINAGE AREA (revised).--401 sq mi.

PERIOD RECORD.--Water temperatures: November 1966 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 24.0°C July 16; minimum, freezing point on many days during November to March.

Period of record:

Water temperatures: Maximum, 24.0°C July 16, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Dec. 29 to Jan. 2; range in temperature 0.0°C. No temperature record May 24 to June 3.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	11.0	9.0	7.0	7.0	1.0	1.0	---	---	2.0	2.0	1.0	0
2	12.0	9.0	7.0	7.0	1.0	1.0	---	---	2.0	2.0	1.0	1.0
3	16.0	11.0	7.0	6.0	2.0	1.0	0	0	1.0	1.0	1.0	0
4	15.0	12.0	6.0	4.0	2.0	1.0	0	0	1.0	1.0	2.0	1.0
5	15.0	13.0	6.0	4.0	2.0	1.0	0	0	1.0	1.0	2.0	2.0
6	13.0	10.0	4.0	3.0	2.0	1.0	0	0	2.0	1.0	2.0	1.0
7	10.0	8.0	3.0	3.0	2.0	2.0	0	0	2.0	2.0	2.0	1.0
8	11.0	9.0	3.0	3.0	2.0	2.0	0	0	2.0	1.0	4.0	2.0
9	11.0	9.0	4.0	3.0	2.0	1.0	0	0	2.0	1.0	3.0	3.0
10	9.0	8.0	5.0	4.0	1.0	1.0	0	0	1.0	1.0	3.0	2.0
11	8.0	8.0	6.0	5.0	2.0	1.0	0	0	1.0	1.0	3.0	1.0
12	8.0	8.0	6.0	5.0	2.0	2.0	0	0	1.0	1.0	2.0	1.0
13	8.0	8.0	5.0	4.0	2.0	1.0	0	0	1.0	1.0	1.0	0
14	10.0	8.0	4.0	3.0	1.0	1.0	0	0	1.0	1.0	2.0	0
15	9.0	9.0	3.0	2.0	1.0	1.0	1.0	0	1.0	1.0	4.0	1.0
16	10.0	5.0	2.0	1.0	1.0	0	0	0	1.0	1.0	4.0	2.0
17	9.0	8.0	3.0	2.0	1.0	1.0	1.0	0	1.0	1.0	4.0	2.0
18	9.0	8.0	3.0	3.0	1.0	1.0	2.0	1.0	1.0	1.0	4.0	2.0
19	9.0	7.0	3.0	3.0	1.0	1.0	2.0	2.0	1.0	1.0	3.0	3.0
20	7.0	6.0	3.0	2.0	1.0	0	2.0	2.0	1.0	1.0	3.0	2.0
21	8.0	7.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	2.0	1.0
22	8.0	6.0	2.0	2.0	2.0	0	2.0	2.0	1.0	1.0	2.0	1.0
23	8.0	8.0	2.0	2.0	0	0	2.0	1.0	1.0	0	1.0	1.0
24	10.0	8.0	2.0	2.0	0	0	1.0	1.0	1.0	0	3.0	1.0
25	10.0	8.0	3.0	2.0	0	0	1.0	1.0	1.0	0	4.0	2.0
26	8.0	7.0	3.0	3.0	0	0	2.0	1.0	1.0	0	6.0	3.0
27	7.0	6.0	3.0	1.0	0	0	2.0	2.0	1.0	1.0	6.0	3.0
28	6.0	6.0	1.0	0	0	0	3.0	2.0	1.0	1.0	7.0	4.0
29	6.0	5.0	1.0	0	---	---	3.0	3.0	1.0	0	7.0	4.0
30	7.0	6.0	1.0	1.0	---	---	3.0	2.0	---	---	6.0	3.0
31	7.0	7.0	---	---	---	---	2.0	2.0	---	---	4.0	4.0
MONTH	15.0	5.0	7.0	0	2.0	0	3.0	0	2.0	0	7.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	6.0	3.0	12.0	8.0	---	---	20.0	17.0	18.0	14.0	14.0	13.0
2	7.0	4.0	12.0	9.0	---	---	19.0	17.0	18.0	14.0	13.0	12.0
3	6.0	4.0	11.0	9.0	---	---	17.0	13.0	19.0	15.0	16.0	12.0
4	7.0	6.0	9.0	8.0	18.0	13.0	17.0	13.0	19.0	16.0	17.0	13.0
5	7.0	4.0	11.0	7.0	20.0	15.0	17.0	13.0	19.0	17.0	17.0	15.0
6	6.0	4.0	12.0	7.0	21.0	17.0	17.0	13.0	21.0	17.0	15.0	13.0
7	8.0	4.0	12.0	8.0	21.0	17.0	18.0	14.0	21.0	18.0	14.0	11.0
8	8.0	7.0	13.0	9.0	21.0	17.0	19.0	16.0	20.0	18.0	14.0	13.0
9	8.0	6.0	13.0	11.0	21.0	18.0	20.0	17.0	19.0	17.0	14.0	13.0
10	8.0	6.0	14.0	9.0	21.0	18.0	19.0	14.0	18.0	15.0	13.0	12.0
11	9.0	6.0	14.0	10.0	20.0	18.0	20.0	15.0	16.0	12.0	14.0	12.0
12	11.0	7.0	13.0	10.0	19.0	15.0	19.0	16.0	15.0	12.0	14.0	11.0
13	12.0	9.0	14.0	11.0	17.0	13.0	21.0	17.0	18.0	13.0	15.0	12.0
14	11.0	5.0	13.0	11.0	17.0	14.0	22.0	18.0	18.0	14.0	15.0	12.0
15	10.0	7.0	17.0	11.0	17.0	13.0	23.0	18.0	17.0	12.0	16.0	12.0
16	11.0	7.0	17.0	13.0	18.0	13.0	24.0	20.0	18.0	16.0	16.0	13.0
17	10.0	9.0	14.0	11.0	17.0	13.0	23.0	19.0	19.0	17.0	17.0	14.0
18	5.0	8.0	15.0	10.0	15.0	12.0	23.0	19.0	18.0	14.0	18.0	15.0
19	12.0	8.0	13.0	11.0	16.0	12.0	21.0	17.0	18.0	16.0	17.0	15.0
20	11.0	9.0	12.0	9.0	17.0	12.0	21.0	17.0	21.0	17.0	16.0	14.0
21	11.0	9.0	12.0	9.0	16.0	13.0	19.0	17.0	19.0	16.0	16.0	13.0
22	13.0	9.0	12.0	9.0	17.0	13.0	22.0	18.0	20.0	17.0	16.0	13.0
23	12.0	10.0	13.0	11.0	17.0	14.0	21.0	17.0	21.0	18.0	17.0	14.0
24	11.0	7.0	---	---	17.0	14.0	20.0	17.0	21.0	18.0	16.0	15.0
25	7.0	6.0	---	---	17.0	14.0	21.0	17.0	19.0	16.0	15.0	13.0
26	7.0	5.0	---	---	14.0	12.0	20.0	16.0	16.0	13.0	13.0	12.0
27	9.0	5.0	---	---	12.0	12.0	19.0	17.0	14.0	11.0	13.0	11.0
28	9.0	6.0	---	---	12.0	12.0	18.0	15.0	14.0	11.0	12.0	10.0
29	11.0	8.0	---	---	14.0	12.0	18.0	14.0	14.0	11.0	12.0	11.0
30	11.0	8.0	---	---	17.0	14.0	19.0	14.0	15.0	12.0	13.0	11.0
31	---	---	---	---	---	---	18.0	16.0	15.0	12.0	---	---
MONTH	13.0	3.0	---	---	21.0	12.0	24.0	13.0	21.0	11.0	18.0	10.0

STREAMS TRIBUTARY TO LAKE HURON

04139000 HOUGHTON CREEK NEAR LUPTON, MICH.

LOCATION.--Lat 44°23'50", long 84°02'55", in SE1/4 sec.10, T.23 N., R.3 E., Ogemaw County, temperature recorder at gaging station on right bank, 0.5 mile upstream from mouth, 3 miles downstream from Walkins Creek, and 3 miles southwest of Lupton.

DRAINAGE AREA (revised).--29.7 sq mi.

PERIOD OF RECORD.--Water temperatures: July 1950 to June 1968 (discontinued).

EXTREMES.--October 1967 to June 1968:

Water temperatures: Maximum, no record; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 20.5°C June 25, 1952; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, OCTOBER 1967 TO JUNE 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.C	7.0	7.0	7.C	3.0	3.0	0	0	3.0	1.0	2.0	1.0
2	11.0	8.0	7.C	7.0	3.0	3.0	0	0	1.0	0	2.0	1.0
3	12.0	11.0	7.0	6.C	4.0	3.0	0	0	0	0	1.0	0
4	13.0	11.0	6.C	5.C	3.0	2.0	0	0	1.0	0	3.0	1.0
5	13.0	12.0	5.0	4.C	3.C	3.0	0	0	2.0	1.0	3.0	2.0
6	11.0	8.0	4.0	3.C	4.0	3.0	0	0	3.0	1.0	3.0	1.0
7	8.0	7.0	4.0	3.0	4.0	3.0	0	0	3.0	2.0	3.0	1.0
8	5.0	8.0	4.0	3.0	3.0	3.0	0	0	2.0	1.0	4.0	2.0
9	9.0	9.0	5.0	4.0	3.0	3.0	0	0	1.0	0	3.0	2.0
10	9.C	8.0	6.C	5.C	3.0	2.0	0	0	0	0	3.0	2.0
11	8.0	7.0	7.0	6.C	3.0	2.0	0	0	0	0	3.0	1.0
12	8.0	7.0	7.0	6.C	3.0	2.0	0	0	0	0	3.0	1.0
13	8.0	7.0	6.0	5.0	2.0	2.0	0	0	0	0	1.0	0
14	10.C	8.0	5.C	3.C	2.0	2.0	2.0	0	0	0	3.0	0
15	10.C	9.0	3.0	2.0	2.0	2.0	2.0	0	0	0	6.0	2.0
16	10.0	9.0	3.0	1.C	2.0	2.0	0	0	0	0	6.0	3.0
17	9.0	8.0	4.0	3.C	3.0	2.0	2.0	0	0	0	6.0	3.0
18	9.0	8.0	4.0	4.C	4.0	3.0	3.0	2.0	0	0	6.0	3.0
19	8.0	7.0	4.0	4.C	4.0	3.0	3.0	3.0	0	0	6.0	4.0
20	7.0	5.0	4.C	3.C	3.0	2.0	3.0	2.0	0	0	4.0	3.0
21	7.0	7.0	3.0	3.0	5.0	3.0	3.0	2.0	0	0	3.0	3.0
22	7.0	6.0	4.0	3.0	5.0	1.0	3.0	3.0	0	0	3.0	2.0
23	8.0	6.0	4.0	4.C	1.0	1.0	3.0	1.0	0	0	3.0	1.0
24	9.0	8.0	4.0	4.C	1.0	1.0	1.0	0	0	0	4.0	1.0
25	5.0	8.0	4.0	4.0	2.0	1.0	0	0	1.0	0	6.0	2.0
26	8.0	7.0	4.0	4.C	2.0	1.0	2.0	0	2.0	1.0	5.0	3.0
27	7.0	6.0	4.0	3.0	1.0	1.0	2.0	2.0	2.0	2.0	6.0	2.0
28	6.0	5.0	3.0	1.0	1.0	0	3.0	2.0	2.0	2.0	8.0	5.0
29	6.0	5.0	2.0	1.0	0	0	3.0	2.0	2.0	1.0	8.0	5.0
30	7.0	6.0	3.0	2.0	0	0	2.0	2.0	---	---	8.0	4.0
31	7.0	7.0	---	---	0	0	2.0	2.0	---	---	8.0	5.0
MONTH	13.0	5.0	7.C	1.0	5.0	0	3.0	0	3.0	0	8.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	6.0	3.0	12.0	7.0	14.C	12.0	---	---	---	---	---	---
2	7.C	4.0	11.0	8.C	14.0	11.0	---	---	---	---	---	---
3	7.0	5.0	11.0	8.0	14.0	11.0	---	---	---	---	---	---
4	8.0	6.0	9.0	8.C	16.0	12.0	---	---	---	---	---	---
5	6.C	3.0	12.0	7.0	18.0	13.0	---	---	---	---	---	---
6	7.0	3.0	12.0	7.0	18.0	14.0	---	---	---	---	---	---
7	8.0	4.0	11.0	8.0	18.0	15.0	---	---	---	---	---	---
8	9.0	7.0	12.0	9.0	18.0	14.0	---	---	---	---	---	---
9	9.0	6.0	14.0	10.0	18.0	16.0	---	---	---	---	---	---
10	8.C	6.0	14.0	9.0	18.0	15.0	---	---	---	---	---	---
11	5.C	5.0	13.0	9.C	17.0	15.0	---	---	---	---	---	---
12	11.0	7.0	13.0	10.0	17.0	13.0	---	---	---	---	---	---
13	11.0	9.0	13.0	11.C	16.0	11.0	---	---	---	---	---	---
14	11.C	9.0	13.0	11.0	15.0	12.0	---	---	---	---	---	---
15	5.0	6.0	16.0	11.0	15.0	12.0	---	---	---	---	---	---
16	10.0	6.0	16.0	12.C	16.0	12.0	---	---	---	---	---	---
17	11.0	8.0	14.0	11.0	14.0	12.0	---	---	---	---	---	---
18	10.C	9.0	14.0	9.C	13.0	11.0	---	---	---	---	---	---
19	12.0	8.0	13.0	10.0	15.0	12.0	---	---	---	---	---	---
20	11.0	8.0	12.0	9.0	15.0	11.0	---	---	---	---	---	---
21	12.0	9.0	13.0	9.0	14.0	12.0	---	---	---	---	---	---
22	13.0	9.0	12.0	9.0	16.0	13.0	---	---	---	---	---	---
23	12.0	9.0	13.0	10.0	16.0	13.0	---	---	---	---	---	---
24	5.0	7.0	15.0	10.0	16.0	13.0	---	---	---	---	---	---
25	7.0	6.0	14.0	11.0	16.0	13.0	---	---	---	---	---	---
26	8.0	6.0	13.0	11.C	13.0	12.0	---	---	---	---	---	---
27	11.0	6.0	11.0	10.0	12.0	12.0	---	---	---	---	---	---
28	10.0	7.0	10.0	9.C	12.0	12.0	---	---	---	---	---	---
29	11.0	8.0	9.0	9.0	14.0	11.0	---	---	---	---	---	---
30	11.0	8.0	10.0	9.0	17.0	13.0	---	---	---	---	---	---
31	---	---	14.0	10.C	---	---	---	---	---	---	---	---
MONTH	13.0	3.0	16.0	7.0	18.0	11.0	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE HURON

61

04139500 RIFLE RIVER AT "THE RANCH" NEAR LUPTON, MICH.

LOCATION.--Lat 44°23'35", long 84°02'15", in SW¹/₄ sec.11, T.23 N., R.3 E., Ogemaw County, temperature recorder at gaging station on left bank, 0.2 mile downstream from Houghton Creek, and 3 miles southwest of Lupton.

DRAINAGE AREA (revised).--56.8 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: July 1950 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum 22.0°C July 16,17; minimum, freezing point on many days during December to February.

Period of record:

Water temperatures: Maximum 22.0°C June 25, 26, 1952, July 5, 6, 9, Aug. 1, 1955, June 30, 1964, July 16, 17, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--Occasional regulation by dams above station.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	9.0	7.0	7.0	7.0	3.0	2.0	0	0	2.0	1.0	2.0	1.0
2	11.0	8.0	7.0	7.0	3.0	3.0	0	0	1.0	0	2.0	1.0
3	12.0	10.0	7.0	7.0	3.0	3.0	0	0	0	0	1.0	1.0
4	13.0	11.0	7.0	6.0	3.0	3.0	0	0	1.0	0	3.0	1.0
5	13.0	12.0	6.0	5.0	3.0	3.0	0	0	1.0	1.0	3.0	2.0
6	12.0	9.0	5.0	4.0	3.0	3.0	0	0	2.0	1.0	3.0	1.0
7	9.0	8.0	4.0	4.0	3.0	3.0	0	0	2.0	1.0	3.0	1.0
8	9.0	4.0	4.0	4.0	3.0	3.0	0	0	1.0	1.0	4.0	2.0
9	9.0	9.0	5.0	4.0	3.0	3.0	0	0	1.0	1.0	3.0	2.0
10	9.0	9.0	6.0	5.0	3.0	2.0	0	0	1.0	0	3.0	2.0
11	5.0	8.0	6.0	6.0	2.0	2.0	0	0	0	0	2.0	1.0
12	8.0	8.0	6.0	6.0	2.0	2.0	0	0	0	0	2.0	1.0
13	8.0	8.0	6.0	5.0	2.0	1.0	0	0	0	0	1.0	1.0
14	10.0	8.0	5.0	4.0	2.0	2.0	0	0	0	0	2.0	1.0
15	10.0	9.0	4.0	3.0	2.0	2.0	1.0	0	0	0	4.0	2.0
16	10.0	9.0	3.0	3.0	2.0	2.0	1.0	1.0	0	0	5.0	3.0
17	10.0	9.0	4.0	3.0	2.0	2.0	1.0	1.0	0	0	5.0	3.0
18	5.0	9.0	4.0	4.0	2.0	2.0	1.0	1.0	0	0	5.0	3.0
19	9.0	8.0	4.0	4.0	2.0	2.0	2.0	1.0	0	0	5.0	4.0
20	8.0	7.0	4.0	3.0	2.0	2.0	2.0	2.0	0	0	4.0	3.0
21	7.0	7.0	3.0	3.0	3.0	2.0	2.0	2.0	0	0	4.0	3.0
22	7.0	7.0	4.0	3.0	3.0	2.0	2.0	2.0	0	0	3.0	2.0
23	8.0	7.0	4.0	4.0	2.0	1.0	2.0	1.0	0	0	3.0	2.0
24	9.0	8.0	4.0	4.0	1.0	1.0	1.0	1.0	0	0	4.0	1.0
25	9.0	8.0	4.0	4.0	1.0	1.0	1.0	1.0	0	0	4.0	3.0
26	8.0	7.0	4.0	4.0	1.0	1.0	1.0	1.0	0	0	4.0	3.0
27	7.0	6.0	4.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	4.0	3.0
28	6.0	6.0	3.0	2.0	1.0	0	2.0	1.0	2.0	1.0	6.0	4.0
29	6.0	6.0	2.0	2.0	0	0	2.0	2.0	2.0	1.0	7.0	5.0
30	7.0	6.0	2.0	2.0	0	0	2.0	2.0	---	---	7.0	6.0
31	7.0	7.0	---	---	0	0	2.0	2.0	---	---	7.0	6.0
MCNTH	13.0	6.0	7.0	2.0	3.0	0	2.0	0	2.0	0	7.0	1.0
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	6.0	4.0	12.0	9.0	15.0	13.0	20.0	18.0	17.0	14.0	15.0	13.0
2	6.0	5.0	12.0	9.0	14.0	12.0	19.0	17.0	17.0	14.0	14.0	14.0
3	6.0	6.0	11.0	10.0	15.0	12.0	18.0	14.0	19.0	15.0	16.0	13.0
4	7.0	6.0	10.0	9.0	17.0	13.0	17.0	14.0	18.0	17.0	17.0	14.0
5	8.0	5.0	11.0	8.0	18.0	14.0	18.0	15.0	18.0	17.0	17.0	16.0
6	7.0	6.0	11.0	9.0	19.0	16.0	18.0	14.0	20.0	17.0	17.0	14.0
7	8.0	6.0	11.0	9.0	18.0	16.0	19.0	16.0	21.0	18.0	14.0	12.0
8	8.0	8.0	12.0	10.0	18.0	15.0	20.0	17.0	20.0	18.0	15.0	13.0
9	9.0	8.0	13.0	11.0	18.0	16.0	20.0	18.0	19.0	17.0	14.0	13.0
10	9.0	8.0	13.0	11.0	18.0	16.0	19.0	16.0	19.0	16.0	14.0	13.0
11	9.0	7.0	13.0	11.0	18.0	16.0	19.0	16.0	17.0	13.0	14.0	13.0
12	11.0	8.0	12.0	11.0	17.0	15.0	19.0	16.0	16.0	13.0	14.0	12.0
13	11.0	10.0	13.0	12.0	16.0	12.0	20.0	17.0	17.0	14.0	15.0	13.0
14	11.0	10.0	13.0	12.0	16.0	13.0	21.0	18.0	18.0	16.0	15.0	13.0
15	10.0	8.0	15.0	12.0	16.0	13.0	21.0	18.0	17.0	13.0	16.0	13.0
16	10.0	8.0	15.0	14.0	17.0	13.0	22.0	19.0	18.0	16.0	16.0	14.0
17	10.0	9.0	14.0	12.0	16.0	13.0	22.0	19.0	19.0	17.0	16.0	14.0
18	10.0	9.0	13.0	11.0	15.0	13.0	21.0	19.0	18.0	15.0	17.0	16.0
19	11.0	9.0	13.0	11.0	16.0	12.0	20.0	17.0	18.0	16.0	17.0	16.0
20	11.0	9.0	12.0	11.0	17.0	13.0	19.0	17.0	21.0	18.0	16.0	15.0
21	11.0	9.0	12.0	11.0	17.0	14.0	19.0	17.0	20.0	17.0	16.0	14.0
22	12.0	10.0	12.0	11.0	18.0	14.0	21.0	17.0	19.0	16.0	16.0	14.0
23	12.0	10.0	12.0	12.0	17.0	16.0	19.0	16.0	20.0	17.0	17.0	15.0
24	10.0	8.0	14.0	12.0	18.0	16.0	18.0	16.0	20.0	17.0	17.0	16.0
25	8.0	8.0	14.0	12.0	17.0	15.0	19.0	16.0	19.0	16.0	16.0	13.0
26	9.0	8.0	13.0	12.0	15.0	14.0	18.0	16.0	16.0	13.0	13.0	12.0
27	10.0	8.0	12.0	11.0	14.0	14.0	18.0	16.0	15.0	12.0	12.0	11.0
28	10.0	9.0	11.0	11.0	14.0	14.0	17.0	14.0	14.0	12.0	12.0	10.0
29	10.0	9.0	11.0	11.0	16.0	13.0	17.0	13.0	15.0	12.0	11.0	10.0
30	11.0	10.0	11.0	11.0	15.0	16.0	18.0	14.0	15.0	12.0	13.0	11.0
31	---	---	15.0	11.0	---	---	17.0	16.0	15.0	12.0	---	---
MCNTH	12.0	4.0	15.0	8.0	19.0	12.0	22.0	13.0	21.0	12.0	17.0	10.0

STREAMS TRIBUTARY TO LAKE HURON

0414000 PRIOR CREEK NEAR SELKIRK, MICH.

LOCATION.--Lat 44°20'10", long 84°04'00", in SE¼ sec.33, T.23 N., R.3 E., Ogemaw County, temperature recorder at gaging station on right bank, 0.2 mile upstream from mouth, 0.5 mile downstream from Ammond Creek, and 1.5 miles north of Selkirk.

DRAINAGE AREA (revised).--21.4 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1950 to June 1968 (discontinued).

EXTREMES.--October 1967 to June 1968:

Water temperatures: Maximum, no record; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 24.5°C Aug. 1, 1955; minimum, freezing point on many days during winter periods.

REMARKS.--Complete ice cover during winter months.

TEMPERATURE (°C) OF WATER, OCTOBER 1967 TO JUNE 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.0	7.0	7.0	7.0	1.0	1.0	0	0	0	0	1.0	1.0
2	12.0	8.0	7.0	7.0	1.0	1.0	0	0	0	0	1.0	1.0
3	13.0	11.0	7.0	6.0	1.0	1.0	0	0	0	0	1.0	1.0
4	15.0	12.0	6.0	5.0	1.0	1.0	0	0	0	0	1.0	1.0
5	14.0	12.0	5.0	4.0	1.0	1.0	0	0	0	0	1.0	1.0
6	12.0	9.0	4.0	3.0	1.0	1.0	0	0	0	0	1.0	1.0
7	9.0	7.0	3.0	2.0	1.0	1.0	0	0	0	0	1.0	1.0
8	9.0	8.0	2.0	2.0	1.0	1.0	0	0	0	0	1.0	0
9	9.0	9.0	4.0	2.0	1.0	1.0	0	0	0	0	0	0
10	5.0	8.0	6.0	4.0	1.0	1.0	0	0	0	0	0	0
11	8.0	7.0	6.0	6.0	1.0	1.0	0	0	0	0	0	0
12	7.0	7.0	6.0	6.0	1.0	1.0	0	0	0	0	0	0
13	7.0	7.0	6.0	4.0	1.0	1.0	0	0	0	0	0	0
14	11.0	7.0	4.0	3.0	1.0	1.0	0	0	0	0	0	0
15	10.0	9.0	3.0	2.0	1.0	1.0	0	0	0	0	0	0
16	5.0	9.0	2.0	2.0	1.0	1.0	0	0	0	0	2.0	0
17	9.0	8.0	2.0	2.0	1.0	1.0	0	0	0	0	3.0	2.0
18	9.0	8.0	3.0	2.0	1.0	1.0	0	0	0	0	3.0	2.0
19	8.0	7.0	3.0	3.0	1.0	1.0	0	0	0	0	3.0	3.0
20	7.0	4.0	3.0	2.0	1.0	1.0	0	0	0	0	3.0	3.0
21	7.0	6.0	2.0	2.0	3.0	1.0	0	0	0	0	3.0	2.0
22	7.0	5.0	2.0	1.0	3.0	1.0	0	0	0	0	2.0	2.0
23	8.0	6.0	2.0	2.0	1.0	1.0	0	0	0	0	2.0	1.0
24	5.0	7.0	2.0	2.0	1.0	1.0	0	0	1.0	0	1.0	1.0
25	5.0	8.0	2.0	2.0	1.0	1.0	0	0	1.0	1.0	2.0	1.0
26	8.0	6.0	2.0	2.0	1.0	1.0	0	0	1.0	1.0	2.0	2.0
27	6.0	4.0	2.0	1.0	1.0	1.0	0	0	1.0	1.0	3.0	2.0
28	4.0	4.0	1.0	1.0	1.0	1.0	0	0	1.0	1.0	6.0	3.0
29	4.0	4.0	1.0	1.0	1.0	0	0	0	1.0	1.0	6.0	4.0
30	7.0	6.0	1.0	1.0	0	0	0	0	---	---	6.0	4.0
31	7.0	7.0	---	---	0	0	0	0	---	---	5.0	5.0
MCNTH	15.0	4.0	7.0	1.0	3.0	0	0	0	1.0	0	6.0	0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5.0	3.0	11.0	7.0	14.0	14.0	---	---	---	---	---	---
2	5.0	3.0	11.0	8.0	14.0	14.0	---	---	---	---	---	---
3	5.0	4.0	10.0	8.0	15.0	14.0	---	---	---	---	---	---
4	6.0	4.0	8.0	7.0	16.0	14.0	---	---	---	---	---	---
5	6.0	4.0	11.0	7.0	18.0	16.0	---	---	---	---	---	---
6	4.0	4.0	12.0	6.0	19.0	17.0	---	---	---	---	---	---
7	6.0	4.0	11.0	7.0	19.0	16.0	---	---	---	---	---	---
8	7.0	6.0	13.0	9.0	18.0	18.0	---	---	---	---	---	---
9	8.0	6.0	15.0	10.0	18.0	17.0	---	---	---	---	---	---
10	8.0	5.0	15.0	9.0	15.0	18.0	---	---	---	---	---	---
11	8.0	4.0	14.0	9.0	19.0	18.0	---	---	---	---	---	---
12	10.0	7.0	13.0	10.0	19.0	17.0	---	---	---	---	---	---
13	11.0	9.0	14.0	11.0	17.0	15.0	---	---	---	---	---	---
14	11.0	9.0	14.0	13.0	17.0	16.0	---	---	---	---	---	---
15	5.0	7.0	21.0	13.0	17.0	16.0	---	---	---	---	---	---
16	5.0	6.0	20.0	15.0	17.0	14.0	---	---	---	---	---	---
17	5.0	8.0	17.0	13.0	16.0	14.0	---	---	---	---	---	---
18	9.0	8.0	18.0	12.0	16.0	14.0	---	---	---	---	---	---
19	12.0	8.0	16.0	12.0	16.0	14.0	---	---	---	---	---	---
20	11.0	8.0	14.0	11.0	16.0	14.0	---	---	---	---	---	---
21	12.0	9.0	15.0	12.0	16.0	14.0	---	---	---	---	---	---
22	13.0	9.0	15.0	12.0	17.0	15.0	---	---	---	---	---	---
23	12.0	9.0	16.0	12.0	17.0	16.0	---	---	---	---	---	---
24	5.0	7.0	18.0	13.0	17.0	16.0	---	---	---	---	---	---
25	7.0	6.0	17.0	13.0	17.0	16.0	---	---	---	---	---	---
26	8.0	5.0	16.0	13.0	16.0	14.0	---	---	---	---	---	---
27	10.0	6.0	14.0	13.0	14.0	14.0	---	---	---	---	---	---
28	5.0	6.0	13.0	12.0	14.0	14.0	---	---	---	---	---	---
29	10.0	7.0	12.0	12.0	14.0	14.0	---	---	---	---	---	---
30	11.0	8.0	13.0	12.0	18.0	14.0	---	---	---	---	---	---
31	---	---	14.0	13.0	---	---	---	---	---	---	---	---
MONTH	13.0	3.0	21.0	6.0	19.0	14.0	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE HURON

04142000 RIFLE RIVER NEAR STERLING, MICH.
(International Hydrological Decade River Station)

LOCATION.--Lat 44°04', long 84°02', SW 1/4 sec.5, T.19 N., R.4 E., Arenac County, at gaging station on left bank 30 ft downstream from bridge on county highway, 3 miles north of Sterling, and 18 miles upstream from month.

DRAINAGE AREA.--320 sq mi, approximately.

PERIOD OF RECORD.--Sediment records: April to September 1966 (daily), October 1966 to September 1968 (periodic).

REMARKS.--Occasional regulation by dams above station.

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)		DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	
OCT 2, 1967	1100	180	18	8.7		MAY 21.....	1100	301	19	15	
OCT 15.....	1500	179	14	6.8		MAY 29.....	1700	1610	252	1100	
OCT 22.....	1200	179	12	5.8		JUN 5.....	1100	360	42	41	
OCT 30.....	1200	211	20	11		JUN 10.....	1200	323	44	38	
NOV 8.....	1200	220	17	10		JUN 18.....	1100	213	10	5.8	
NOV 14.....	1200	280	21	16		JUN 19.....	1050	263	16	11	
NOV 18.....	1600	230	22	14		JUN 27.....	1100	659	116	206	
NOV 23.....	1200	220	19	11		JUL 4.....	1100	230	34	21	
NOV 25.....	1200	230	11	6.8		AUG 6.....	1200	187	48	24	
DEC 6.....	1200	210	10	5.7		AUG 7.....	1200	287	110	85	
APR 12, 1968	1300	346	22	21		AUG 12.....	1200	166	20	9.0	
APR 15.....	1100	465	50	63		AUG 21.....	1200	170	26	12	
APR 21.....	1100	409	44	49		SEP 8.....	1200	155	14	5.9	
MAY 1.....	1200	291	16	13		SEP 22.....	1100	233	6	3.8	
MAY 2.....	1200	277	9	6.7							

04144000 SHIAWASSEE RIVER AT BYRON, MICH.

LOCATION.--Lat 42°49'25", long 83°56'45", on line between secs. 14 and 23, T.5 N., R.4 E., Shiawassee County, temperature recorder at gaging station on left bank at upstream side of highway bridge at Byron, 0.2 mile downstream from milldam which is just upstream from South Branch Shiawassee River.

DRAINAGE AREA.--368 sq mi.

PERIOD OF RECORD.--Water temperatures: March 1962 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum 28.0°C July 17, 18; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum 28.5°C July 22, 1964; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	10.0	10.0	9.0	2.0	2.0	0	0	0	0	0	0
2	14.0	12.0	10.0	10.0	2.0	2.0	0	0	0	0	0	0
3	16.0	14.0	10.0	5.0	2.0	2.0	0	0	0	0	0	0
4	18.0	16.0	9.0	7.0	2.0	2.0	0	0	0	0	0	0
5	19.0	18.0	7.0	6.0	2.0	2.0	0	0	0	0	0	0
6	18.0	15.0	6.0	5.0	3.0	2.0	0	0	0	0	0	0
7	15.0	14.0	5.0	4.0	3.0	3.0	0	0	0	0	0	0
8	15.0	14.0	4.0	4.0	3.0	3.0	0	0	0	0	1.0	0
9	15.0	14.0	5.0	4.0	3.0	2.0	0	0	0	0	1.0	1.0
10	14.0	12.0	6.0	5.0	2.0	2.0	0	0	0	0	2.0	1.0
11	12.0	11.0	7.0	6.0	2.0	2.0	0	0	0	0	3.0	2.0
12	11.0	11.0	8.0	7.0	2.0	2.0	0	0	0	0	3.0	1.0
13	12.0	11.0	8.0	7.0	2.0	2.0	0	0	0	0	1.0	1.0
14	13.0	12.0	7.0	4.0	2.0	1.0	0	0	0	0	1.0	1.0
15	13.0	13.0	4.0	3.0	1.0	0	0	0	0	0	2.0	1.0
16	13.0	13.0	3.0	2.0	0	0	0	0	0	0	4.0	2.0
17	13.0	13.0	3.0	2.0	0	0	0	0	0	0	4.0	3.0
18	13.0	12.0	3.0	3.0	1.0	0	0	0	0	0	5.0	3.0
19	12.0	11.0	3.0	3.0	1.0	1.0	0	0	0	0	6.0	5.0
20	11.0	10.0	3.0	3.0	1.0	1.0	0	0	0	0	7.0	6.0
21	10.0	9.0	3.0	3.0	4.0	1.0	0	0	0	0	7.0	5.0
22	9.0	9.0	3.0	3.0	4.0	2.0	0	0	0	0	5.0	3.0
23	10.0	9.0	3.0	3.0	2.0	0	0	0	0	0	3.0	1.0
24	12.0	10.0	3.0	3.0	0	0	0	0	0	0	3.0	1.0
25	12.0	11.0	4.0	3.0	0	0	0	0	0	0	4.0	2.0
26	11.0	9.0	4.0	4.0	0	0	0	0	0	0	6.0	4.0
27	9.0	7.0	4.0	3.0	0	0	0	0	0	0	8.0	6.0
28	7.0	6.0	3.0	2.0	0	0	0	0	0	0	10.0	8.0
29	7.0	6.0	2.0	2.0	0	0	0	0	0	0	11.0	10.0
30	8.0	6.0	2.0	2.0	0	0	0	0	---	---	11.0	10.0
31	5.0	8.0	---	---	0	0	0	0	---	---	11.0	10.0
MONTH	19.0	6.0	10.0	2.0	4.0	0	0	0	0	0	11.0	0

STREAMS TRIBUTARY TO LAKE HURON
04151500 CASS RIVER AT FRANKENMUTH, MICH.
(International Hydrological Decade River Station)

LOCATION.--Lat 43°19'50", long 83°45'25", in SW 1/4 sec.13, T.7 N., R.2 E., Saginaw County, at bridge on Dehmel Road, 1.1 miles downstream from dam in Frankenmuth, 0.7 mile downstream from gaging station, and 2.7 miles upstream from Dead Creek.

DRAINAGE AREA.--848 sq mi.

PERIOD OF RECORD.--Sediment records: May 1966 to September 1968.

EXTREMES.--1967-68:

Sediment concentrations: Maximum daily, 309 mg/l Mar. 27; minimum daily, 2 mg/l Nov. 26, 27.
Sediment loads: Maximum daily, 5,170 tons Mar. 27; minimum daily, 1.7 tons Sept. 29.

Period of record:

Sediment concentrations: Maximum daily, 535 mg/l Mar. 28, 1967; minimum daily, 2 mg/l Nov. 26, 27, 1967.
Sediment loads: Maximum daily, 13,800 tons Mar. 28, 1967; minimum daily, 0.38 ton Oct. 11, 12, 1968.

REMARKS.--Flow affected by ice Nov. 30 to Dec. 2, Dec. 9, Dec. 31 to Mar. 15. Loads were computed by subdividing day on Dec. 11, 12, 21, 22, Jan. 29, Mar. 26, May 28, June 26. Occasional regulation by dams above station.

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	151	15	6.1	467	26	33	300	5	4.0
2	184	13	4.9	650	25	44	302	5	4.0
3	129	13	4.5	1330	43	154	299	6	4.8
4	118	12	3.8	1640	58	257	299	10	8.1
5	165	12	3.7	2039	55	301	305	12	9.9
6	93	14	3.5	1490	32	129	332	13	12
7	81	17	3.7	1010	15	41	411	12	13
8	75	20	4.0	744	9	18	545	7	10
9	79	24	5.1	594	7	11	650	9	16
10	98	24	5.7	497	7	9.4	770	7	15
11	93	23	5.8	489	6	7.9	1090	14	45
12	103	24	6.7	672	6	11	3380	175	1710
13	100	25	6.8	959	10	26	4870	236	3100
14	96	26	6.7	1050	14	40	3660	79	781
15	99	28	7.5	966	11	29	2170	31	182
16	114	29	8.9	824	7	16	1360	18	64
17	152	27	11	677	6	11	1040	10	28
18	155	22	12	704	5	9.5	853	7	16
19	237	15	9.6	1763	12	41	784	8	17
20	264	12	9.3	1690	27	123	704	5	0.5
21	239	12	7.7	1200	22	71	827	16	42
22	208	12	6.7	938	15	38	2320	62	335
23	177	14	6.7	820	12	27	3470	282	2640
24	160	15	6.5	735	7	14	1770	118	564
25	148	15	6.0	653	3	5.3	1200	108	350
26	144	13	5.1	597	2	3.2	878	37	88
27	151	13	5.3	547	2	3.0	614	18	30
28	266	16	11	475	4	5.1	587	14	22
29	950	25	64	325	5	4.4	562	15	23
30	740	24	59	310	7	5.0	436	12	14
31	548	35	52	--	--	--	390	23	24
TOTAL	6283	--	359.3	26351	--	1488.7	37176	--	10183.3
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	327	23	20	3670	35	340	180	10	4.9
2	290	13	10	6000	67	1090	180	10	4.9
3	260	17	7.0	10000	145	3920	189	10	4.9
4	740	10	6.5	8200	94	2830	185	10	5.0
5	220	10	5.9	5200	47	660	190	10	5.1
6	210	10	5.7	4000	35	378	200	10	5.4
7	230	10	5.4	2770	22	160	220	10	5.9
8	190	10	5.1	1900	15	77	270	10	7.3
9	140	10	4.9	1400	10	38	350	10	9.5
10	180	10	4.9	1100	10	30	700	10	10
11	180	10	4.9	950	10	26	1300	36	126
12	180	10	4.9	820	10	22	1100	33	98
13	190	10	5.1	700	10	19	900	14	34
14	190	10	5.1	600	10	16	800	80	173
15	190	10	5.1	500	10	14	750	60	140
16	270	10	5.4	420	10	11	743	10	20
17	260	10	5.4	360	10	9.7	833	10	22
18	210	10	5.7	320	10	8.6	1220	22	77
19	220	10	5.9	290	10	7.8	1310	61	216
20	770	10	5.9	270	10	7.3	1300	43	151
21	230	10	6.2	250	10	6.8	1330	34	122
22	240	10	6.5	230	10	6.2	1240	24	80
23	250	10	6.8	220	10	5.9	1020	10	28
24	245	10	6.6	200	10	5.4	863	5	8.7
25	240	10	6.5	195	10	5.3	653	7	12
26	235	10	6.3	185	10	5.0	2180	145	1000
27	230	10	6.2	180	10	4.9	6200	309	5170
28	240	10	6.5	180	10	4.9	6990	168	3170
29	350	27	30	180	10	4.9	4320	78	910
30	1100	78	232	--	--	--	2740	55	407
31	2500	56	378	--	--	--	1860	52	261
TOTAL	10130	--	829.4	50950	--	8913.7	42087	--	12382.6

STREAMS TRIBUTARY TO LAKE HURON

04151500 CASS RIVER AT FRANKENMUTH, MICH.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)
1	1540	26	108	408	19	21	1310	24	85
2	1350	24	87	365	20	20	1110	20	60
3	1110	15	45	332	22	20	954	20	57
4	1010	4	11	327	22	19	734	25	40
5	1050	6	17	315	20	17	560	24	36
6	1010	6	16	289	16	12	441	26	31
7	846	5	11	261	15	11	358	26	25
8	721	5	9.7	239	18	12	339	23	21
9	640	5	8.6	240	19	12	304	25	21
10	547	6	8.9	274	18	13	271	25	18
11	483	7	9.1	283	16	12	713	27	52
12	436	7	9.2	253	17	12	560	28	42
13	399	8	8.6	248	20	13	531	31	44
14	400	12	13	254	22	15	407	33	36
15	624	30	51	563	22	33	314	30	25
16	828	30	67	820	28	62	261	25	18
17	691	24	45	881	20	48	231	24	15
18	641	21	36	617	19	32	205	25	14
19	704	18	34	570	22	34	203	30	16
20	644	16	28	786	21	45	204	25	14
21	590	16	25	865	23	54	201	35	15
22	584	17	27	725	17	33	265	43	31
23	558	19	29	568	16	25	247	28	19
24	842	22	38	456	14	17	229	23	14
25	811	21	46	364	13	13	256	24	17
26	757	19	39	309	14	12	1120	60	202
27	660	20	36	420	16	18	3160	196	1160
28	546	19	28	1530	52	240	3500	112	1060
29	455	19	23	2770	88	668	2620	77	845
30	424	20	23	2470	46	307	1700	44	202
31	--	--	--	1820	35	172	--	--	--
TOTAL	21701	--	936.1	20622	--	2012	23308	--	3934
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TNS)
1	1310	32	113	101	57	16	42	34	3.9
2	951	25	64	96	66	17	55	34	6.0
3	659	56	100	92	65	16	57	35	5.4
4	481	67	87	90	61	15	53	33	6.7
5	373	74	75	88	54	13	50	29	3.9
6	377	79	80	117	46	15	48	29	3.8
7	360	76	74	83	41	9.2	46	32	4.0
8	325	70	61	74	38	7.6	43	34	3.9
9	279	64	48	61	38	6.3	43	36	4.2
10	334	59	53	59	38	6.1	49	40	5.3
11	457	52	64	58	35	5.5	59	44	7.0
12	323	44	38	60	31	5.0	65	45	7.0
13	244	37	24	63	29	4.9	65	42	7.4
14	207	29	16	64	27	4.7	69	37	6.9
15	182	21	10	61	26	4.3	66	32	6.7
16	161	16	7.0	61	28	4.6	59	28	4.5
17	145	12	4.7	63	32	5.4	54	28	4.1
18	148	13	5.2	58	36	5.6	51	28	3.9
19	184	51	25	66	38	6.8	52	34	4.8
20	201	30	16	69	39	7.2	101	42	11
21	181	21	10	63	37	6.3	111	48	14
22	157	23	9.7	59	35	5.6	82	39	8.6
23	138	25	9.3	57	34	5.2	69	24	4.5
24	132	27	9.6	56	36	5.4	65	18	3.2
25	131	29	10	52	37	5.2	62	15	2.5
26	123	30	10	46	37	4.6	61	13	2.1
27	115	32	9.9	46	37	4.6	59	12	1.9
28	109	34	10	45	38	4.6	57	12	1.5
29	107	36	10	43	39	4.5	54	12	1.7
30	103	39	11	42	38	4.3	52	13	1.8
31	101	46	13	42	35	4.0	--	--	--
TOTAL	9098	--	1077.4	2034	--	229.5	1799	--	149.4
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)									251539
TOTAL LOAD FOR YEAR (TNS)									42486.4

STREAMS TRIBUTARY TO LAKE ERIE

04176500 RIVER RAISIN NEAR MONROE, MICH.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	87	52	12	318	31	27	352	34	32
2	105	54	15	670	25	45	356	36	35
3	100	53	14	748	16	32	519	29	41
4	98	51	13	1180	53	169	789	18	38
5	83	51	11	1170	54	171	965	16	41
6	75	53	11	1070	46	133	1170	8	25
7	69	53	9.9	934	43	108	1600	5	22
8	65	47	8.2	772	32	67	1570	9	38
9	67	34	6.2	628	35	59	1520	10	41
10	87	31	7.3	526	27	38	1530	13	54
11	81	25	5.5	479	21	27	3170	156	1400
12	85	32	7.3	526	30	43	3470	30	1930
13	77	34	7.1	610	33	54	3310	116	1030
14	75	30	6.1	676	24	44	3160	67	577
15	98	28	7.4	670	17	31	2870	44	341
16	226	34	21	586	17	27	2530	44	301
17	435	83	112	950	22	33	2100	40	227
18	1190	218	700	760	26	53	1550	31	130
19	1040	59	166	913	29	71	1360	27	99
20	1020	50	138	955	31	80	1310	23	81
21	864	44	103	922	39	97	2440	453	4260
22	688	45	84	312	34	75	720	1430	2800
23	474	41	52	735	52	103	6490	940	16500
24	358	39	38	681	55	101	6570	364	6460
25	304	29	24	619	34	57	6470	113	1960
26	277	22	16	562	20	30	5290	43	614
27	277	36	27	505	16	22	3860	45	469
28	264	15	11	449	10	12	2990	43	347
29	277	18	13	408	11	12	1990	45	242
30	304	30	25	391	24	25	1500	43	174
31	304	52	43	--	--	--	1180	43	137
TOTAL	9554	--	1714	20825	--	1846	81151	--	65641
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	1070	56	162	4000	166	1790	350	6	5.7
2	1000	66	178	5000	98	1320	340	5	4.6
3	950	72	185	7000	45	851	330	4	3.6
4	900	83	202	7700	20	416	330	4	4.6
5	850	77	177	6750	9	164	329	4	3.6
6	800	74	160	5300	11	157	376	4	3.5
7	750	75	152	3960	5	53	362	4	3.9
8	700	73	138	3010	5	41	367	4	4.0
9	680	70	129	2320	5	31	387	8	8.4
10	640	66	114	1710	5	23	395	7	7.5
11	620	58	97	1350	5	18	402	5	5.4
12	600	52	84	1050	5	14	413	7	7.9
13	580	55	86	936	5	13	463	8	10
14	570	68	105	850	5	11	393	11	12
15	560	83	125	800	4	8.6	396	9	9.6
16	560	85	129	720	3	5.8	676	52	104
17	550	74	110	670	2	3.6	1110	74	222
18	550	54	80	620	3	5.0	1690	114	520
19	540	40	58	600	3	4.9	1750	113	534
20	530	35	50	550	5	7.4	1640	87	263
21	520	32	45	520	3	4.2	1540	63	262
22	520	30	42	500	3	4.1	1530	45	186
23	520	30	42	470	2	2.5	1450	44	172
24	510	24	33	450	4	4.9	1350	54	197
25	500	18	24	420	3	3.4	1370	63	233
26	500	16	22	400	2	2.2	2330	180	1180
27	500	16	22	371	7	7.0	3210	177	1530
28	800	20	43	365	11	11	3060	118	975
29	3220	54	504	419	9	10	2890	91	710
30	4320	147	1710	--	--	--	2360	45	287
31	4010	235	2540	--	--	--	1830	49	242
TOTAL	29920	--	7548	58821	--	4986.6	35374	--	7810.3

STREAMS TRIBUTARY TO LAKE ERIE

04176500 RIVER RAISIN NEAR MONROE, MICH.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	1390	47	176	450	26	32	4600	48	596
2	1120	44	133	410	27	30	3840	33	347
3	987	40	107	380	26	27	2980	41	330
4	1580	45	192	370	25	25	2290	40	247
5	2010	59	320	370	26	26	1670	30	176
6	2140	39	225	380	24	25	1180	35	112
7	2100	47	266	380	22	23	927	28	70
8	1890	37	189	354	27	21	748	23	46
9	1600	29	125	372	21	21	634	23	39
10	1400	31	117	410	21	23	578	23	36
11	1200	46	149	496	29	39	538	24	35
12	1100	52	154	425	24	28	496	27	36
13	1000	36	97	390	39	41	452	26	32
14	950	32	82	376	30	30	420	22	25
15	900	31	75	358	24	23	415	23	26
16	900	35	85	778	135	406	380	24	25
17	800	34	73	1340	140	507	344	27	25
18	750	35	71	1310	53	187	336	26	24
19	700	35	66	1210	47	186	308	22	18
20	680	34	62	1020	45	124	282	23	18
21	670	30	54	826	35	78	272	23	17
22	660	31	55	712	29	56	277	23	17
23	660	39	69	640	27	48	286	21	16
24	650	29	51	568	26	40	313	23	19
25	640	24	41	514	25	35	712	112	280
26	630	24	41	502	51	69	4120	777	8770
27	600	27	44	3070	611	5160	6970	300	5650
28	560	29	44	4000	333	5390	5720	185	2860
29	520	27	38	6090	206	3390	4500	128	1560
30	480	26	34	5480	108	1600	4510	66	804
31	--	--	--	5060	72	984	--	--	--
TOTAL	31267	--	3235	41061	--	18874	51098	--	22251

DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	4020	44	478	950	52	133	248	30	20
2	3120	43	362	860	49	114	266	37	23
3	2600	39	274	800	47	102	261	42	30
4	1800	42	204	760	47	89	256	45	31
5	1200	46	149	700	42	79	270	39	28
6	1300	38	133	640	42	73	270	35	26
7	1000	27	73	640	45	78	250	34	25
8	850	26	60	600	47	102	240	35	23
9	850	53	122	1400	42	159	230	40	25
10	871	45	106	2000	42	227	240	41	27
11	920	22	55	1300	44	154	260	35	25
12	1030	31	86	861	42	98	280	31	23
13	1010	33	90	756	40	82	280	27	20
14	1000	33	89	648	42	73	270	27	20
15	900	39	95	534	47	68	250	30	20
16	800	36	78	681	69	127	250	24	16
17	700	38	72	1720	100	329	250	25	17
18	700	44	83	1300	86	302	250	23	16
19	700	33	62	1180	65	207	250	19	13
20	600	25	41	917	52	129	250	18	12
21	550	26	39	775	40	78	270	20	15
22	500	28	38	598	32	52	290	29	23
23	450	35	43	612	30	41	300	23	17
24	470	42	53	447	28	34	310	20	17
25	900	39	95	395	30	37	300	31	25
26	1800	29	141	348	36	34	290	22	17
27	1700	36	165	320	36	31	280	16	12
28	1500	52	211	294	28	22	270	14	10
29	1400	62	234	260	23	16	270	22	16
30	1300	67	218	249	24	16	260	33	23
31	1100	57	169	239	26	17	--	--	--
TOTAL	37641	--	4118	23374	--	3098	7961	--	615

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 427997
 TOTAL LOAD FOR YEAR (TONS) 141736.0

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPENSED; N, IN NATIVE WATER; P, PIPE; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	SUSPENDED SEDIMENT										METHOD OF ANALYSIS	
						PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED											
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	
DEC 12,	1450		3540	269	2570	58	72	76	90	95	98	100	--	--	--	--	SCAW
JAN 30,	1700		4330	162	1890	52	65	76	88	94	96	100	--	--	--	--	SCAW
JAN 30,	1700		4330	162	1890	11	31	57	91	94	95	100	--	--	--	--	SCAW
MAY 27,	1130		2950	807	6430	58	71	78	85	92	98	100	--	--	--	--	SCAW

04185600 MAUMEE RIVER AT DEFIANCE, OHIO

LOCATION.--Lat 41°16'43", long 84°23'07", Defiance County, at waterworks on right bank at Defiance, about 300 ft upstream from Tiffin River, 1.8 miles upstream from Auglaize River, and 6 miles upstream from gaging station near Defiance.

DRAINAGE AREA.--3,094 sq mi (includes Tiffin River).

PERIOD OF RECORD.--Chemical analyses: January 1966 to September 1968.
Water Temperatures: January 1966 to September 1966.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 1,030 micromhos Oct. 14; minimum daily 240 micromhos Dec. 22, 23.
Dissolved oxygen: Maximum daily, 15.0 mg/l or greater on several days during October, April and May; minimum daily, 1.1 mg/l June 25, 26.
Water temperatures: Maximum, 28.0°C on several days in June to August; minimum, freezing point on many days during January to March.

Period of record:

Specific conductance: Maximum daily, 1,030 micromhos Oct. 14, 1967; minimum daily, 240 micromhos Dec. 22, 23, 1967.
Dissolved oxygen: Maximum daily, 15.0 mg/l or greater on many days during May to July, September to December 1966, October 1967, April and May 1968; minimum daily, 0.2 mg/l Aug. 23, 1966.
Water temperatures: Maximum, 32.0°C July 3, 1966; minimum, freezing point on many days during January and December 1966, January to March 1967, and January to March 1968.

REMARKS.--In addition to the continuous recorder, samples were collected three times a week by a local observer. Partial analyses were made on the maximum and minimum specific conductance of the samples collected each month. Dissolved oxygen concentrations listed as 15.0 mg/l represent concentrations of 15.0 mg/l or greater, due to instrument limitations. Interruptions in the record were due to malfunctions of the instrument. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	BICAR- BONATE (HCO ₃)	CAP- RONATE (CO ₃)	SULFATE (SO ₄)	CHLO- RIDE (Cl)	FLUO- RIDE (F)	NITRATE (NO ₃)	DIS- SOLVED SOLIDS RESI- DUUE AT 180 C	HARD- NESS (CA+MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH
OCT.												
04...	0930	262	0	152	65	1.1	7.3	562	376	111	986	7.4
27...	1300	248	8	91	34	.7	9.5	404	298	81	659	8.5
NOV.												
03...	1300	244	0	113	46	.8	14	462	376	106	734	7.3
13...	1509	196	0	121	34	.5	36	432	310	149	690	7.2
DEC.												
01...	0730	198	12	134	37	.6	30	508	343	161	711	8.7
22...	0830	128	0	40	9.0	.3	19	210	152	57	299	7.4
JAN.												
24...	1230	230	16	128	72	.6	7.9	560	338	123	847	8.7
31...	1200	92	0	35	9.0	.3	12	172	125	60	268	8.2
FEB.												
05...	0903	96	0	34	10	.2	18	216	138	50	286	7.3
28...	0830	256	4	117	28	.4	14	490	356	139	720	8.3
MAR.												
04...	0830	240	16	128	32	.4	14	484	354	131	758	8.6
08...	0900	256	0	120	28	.4	14	446	334	124	710	8.0
APR.												
09...	1645	160	0	79	16	.1	4.0	314	238	107	480	7.4
29...	1000	256	0	111	24	.2	5.6	446	322	112	680	7.7
MAY												
13...	1030	248	0	108	30	.5	6.5	422	314	111	684	8.2
17...	1000	138	0	42	12	.3	17	226	168	55	365	7.6
JUNE												
21...	1030	278	0	108	28	.6	2.5	438	340	112	690	7.4
28...	1030	144	0	50	12	.3	19	274	186	68	403	7.7
JULY												
12...	0830	244	0	88	20	.4	14	406	302	102	615	7.5
18...	0830	178	0	67	19	.3	12	300	210	73	481	8.0
AUG.												
09...	0900	204	12	99	30	.3	11	428	296	100	625	8.6
21...	0745	160	10	53	12	.5	12	286	214	66	425	8.5
SEPT.												
18...	0800	300	0	115	40	.8	9	492	338	92	758	8.0
27...	0830	196	0	67	22	.5	10	316	232	72	505	7.6

SPECIFIC CONDUCTANCE, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER						NOVEMBER						DECEMBER					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	7.8	6.0	16	12	--	--	6.0	4.5	12	11	720	710	9.5	9.3	2	1
2	--	--	11.5	6.5	17	14	810	730	6.9	3.8	12	11	730	640	9.5	9.2	2	1
3	--	--	15.0	11.2	18	16	840	680	7.5	6.3	11	10	640	520	9.5	9.3	2	2
4	--	--	15.0	8.3	20	17	750	690	8.0	7.3	11	8	600	500	9.3	8.2	3	2
5	--	--	11.0	8.2	21	19	690	550	9.0	7.1	8	6	580	490	8.9	8.4	3	3
6	960	860	11.9	6.8	19	17	710	600	11.0	8.8	6	5	500	460	9.1	8.9	4	3
7	970	860	13.9	9.7	17	16	720	630	9.0	7.1	6	5	510	460	9.0	8.4	6	4
8	820	780	13.5	10.7	17	16	720	690	--	--	5	4	520	500	8.4	8.0	6	5
9	900	850	11.2	8.2	16	14	740	670	--	--	6	4	520	480	8.0	7.7	6	5
10	880	850	8.3	7.8	14	13	710	660	--	--	7	6	480	370	8.1	7.7	5	5
11	900	860	8.4	7.4	13	12	700	630	--	--	8	7	430	380	7.9	7.4	6	5
12	950	900	8.2	7.2	12	11	710	620	--	--	8	8	440	410	8.4	7.8	6	6
13	980	930	7.2	6.4	12	12	680	600	--	--	10	7	450	420	8.2	7.7	6	6
14	1030	930	6.6	6.0	13	12	740	680	--	--	7	5	430	410	8.1	7.8	6	6
15	1010	910	6.5	5.1	15	13	740	690	--	--	5	3	440	420	8.5	8.0	6	5
16	920	860	5.4	4.8	15	14	780	710	--	--	3	2	440	430	8.8	8.4	5	4
17	970	890	4.9	3.6	16	14	720	710	8.8	8.7	4	3	450	430	9.2	8.7	4	3
18	910	750	5.4	4.0	14	13	710	690	8.7	8.5	4	4	460	440	9.4	9.1	4	3
19	780	720	5.0	4.5	14	12	720	690	8.5	7.9	5	4	470	450	10.4	9.3	3	3
20	830	720	5.0	4.4	13	11	720	650	8.0	7.4	5	4	500	470	10.3	10.2	3	2
21	720	600	5.9	4.6	12	11	690	650	8.0	7.4	4	4	500	310	10.2	9.0	8	3
22	610	560	7.4	5.8	11	10	710	690	8.0	7.7	5	4	310	240	9.0	8.5	8	7
23	740	600	8.9	6.7	12	10	730	700	8.2	7.7	5	4	270	240	8.8	8.6	7	5
24	770	710	8.5	6.3	13	11	730	710	8.1	8.0	4	4	290	270	9.3	8.8	5	3
25	770	710	6.5	3.7	13	11	720	710	8.2	7.9	6	4	320	290	9.7	9.3	4	3
26	730	670	6.5	5.0	11	10	720	710	8.1	7.8	6	5	340	320	9.9	9.7	3	1
27	710	650	6.5	5.2	10	9	710	700	8.6	7.9	5	3	390	340	10.2	7.5	4	1
28	700	670	6.1	5.0	9	8	700	680	9.0	8.6	3	2	390	360	10.3	8.2	2	1
29	800	690	5.8	5.0	8	8	710	690	9.1	8.9	3	1	450	390	10.3	7.5	4	1
30	--	--	6.3	4.8	10	8	720	700	9.5	9.0	2	1	480	420	10.1	7.6	4	1
31	--	--	7.0	4.6	11	10	--	--	--	--	--	--	480	450	10.4	10.2	1	1
DAY	JANUARY						FEBRUARY						MARCH					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	510	470	10.7	10.0	1	1	280	260	12.0	11.0	3	2	730	710	9.8	9.6	0	0
2	530	500	10.6	10.4	1	1	300	280	11.6	10.9	4	3	740	720	10.0	9.6	1	0
3	550	530	10.4	10.2	1	1	300	290	12.0	10.8	3	3	760	740	10.3	10.0	0	0
4	570	550	10.2	10.0	1	1	290	280	12.3	11.1	3	2	790	750	10.4	10.1	0	0
5	610	570	10.0	9.6	1	1	290	280	12.9	11.2	2	2	780	750	10.3	10.1	0	0
6	660	610	9.7	9.4	1	1	300	280	12.1	11.3	2	2	750	730	10.4	10.1	0	0
7	--	--	--	--	--	--	340	300	11.8	10.8	3	2	--	--	--	--	--	--
8	--	--	--	--	--	--	380	340	10.8	10.4	3	2	--	--	--	--	--	--
9	--	--	--	--	--	--	390	370	10.4	9.5	3	2	--	--	--	--	--	--
10	--	--	--	--	--	--	450	390	9.7	9.2	2	2	--	--	--	--	--	--
11	--	--	--	--	--	--	530	440	10.3	9.3	2	1	--	--	--	--	--	--
12	--	--	--	--	--	--	510	470	12.6	9.8	1	0	--	--	--	--	--	--
13	--	--	--	--	--	--	510	500	12.6	12.5	1	0	--	--	--	--	--	--
14	--	--	--	--	--	--	510	490	12.5	12.2	1	0	--	--	--	--	--	--
15	--	--	--	--	--	--	550	510	12.2	12.0	1	0	--	--	--	--	--	--
16	750	740	9.4	9.2	0	0	590	540	12.0	11.6	1	0	--	--	--	--	--	--
17	740	730	9.3	8.9	0	0	600	580	11.7	11.5	1	0	--	--	--	--	--	--
18	770	730	9.0	8.6	0	0	630	600	11.5	11.3	1	0	--	--	--	--	--	--
19	770	740	8.8	8.6	0	0	630	610	11.3	11.2	1	0	590	460	11.5	11.1	7	5
20	830	770	8.8	8.7	0	0	640	610	11.2	11.1	1	0	490	450	11.1	10.1	7	7
21	830	780	8.7	8.3	0	0	660	630	11.2	11.0	0	0	500	490	10.6	10.1	7	6
22	780	770	8.3	8.3	0	0	690	650	11.0	10.6	0	0	500	490	10.6	10.1	7	6
23	900	770	8.3	8.1	0	0	710	690	10.7	10.5	0	0	520	490	10.9	10.3	6	4
24	900	820	8.7	8.3	0	0	720	700	10.6	10.4	1	0	580	510	11.1	10.9	6	4
25	820	770	9.5	8.6	0	0	730	710	10.5	10.2	0	0	580	520	11.4	11.1	6	4
26	780	680	10.0	9.5	0	0	740	710	10.3	9.9	0	0	530	450	11.7	11.3	6	5
27	680	540	10.0	9.7	1	0	740	730	10.0	9.8	0	0	900	450	11.6	11.2	7	6
28	540	440	10.6	9.6	1	0	730	720	9.9	9.8	0	0	460	420	11.1	10.6	9	7
29	440	310	11.2	10.6	1	1	730	720	9.9	9.8	0	0	470	420	10.7	10.0	11	9
30	340	250	11.3	10.6	1	1	--	--	--	--	--	--	500	470	10.0	9.3	12	10
31	270	250	11.5	10.7	2	1	--	--	--	--	--	--	490	480	9.5	9.1	12	11

04185600 MAUMEE RIVER AT DEFIANCE, OHIO--Continued

SPECIFIC CONDUCTANCE, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL						MAY						JUNE					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	490	480	9.1	8.3	12	11	660	630	15.0	15.0	17	15	470	460	7.2	7.0	17	16
2	500	480	8.4	8.2	12	11	630	530	15.0	15.0	18	15	470	450	7.4	7.1	18	16
3	530	500	8.2	7.9	12	11	660	630	15.0	13.2	18	17	490	470	7.3	6.9	18	17
4	510	270	8.4	8.0	12	11	630	590	15.0	11.6	18	16	500	490	--	--	19	18
5	310	290	8.3	7.3	12	10	650	590	13.6	9.2	17	16	530	500	--	--	21	19
6	330	300	8.5	8.1	10	9	660	650	15.0	9.5	17	14	550	530	--	--	22	21
7	390	330	8.4	7.8	9	9	660	650	15.0	13.0	17	15	--	--	--	--	23	22
8	460	390	9.4	7.1	11	9	700	660	15.0	12.7	17	16	--	--	6.6	5.8	24	23
9	490	460	8.4	7.4	12	10	690	670	13.5	10.3	19	17	--	--	7.3	5.9	26	23
10	540	480	7.9	7.1	12	11	670	620	13.3	10.2	19	17	--	--	8.3	6.3	27	25
11	530	340	7.6	7.1	13	12	630	620	11.9	8.4	19	17	--	--	7.9	6.5	28	26
12	530	400	8.5	7.6	13	11	660	630	11.0	7.2	18	16	620	590	7.3	5.8	26	24
13	580	530	7.8	7.5	14	13	700	660	10.1	7.5	19	17	630	590	9.0	5.8	24	22
14	610	580	7.6	7.2	14	13	700	700	9.7	6.8	19	17	650	630	9.7	6.7	24	22
15	610	590	8.2	7.5	14	13	700	600	11.2	6.6	21	18	650	630	10.0	7.1	24	23
16	640	610	8.1	7.5	14	12	600	370	9.5	4.9	20	17	660	650	8.6	6.4	24	23
17	630	610	7.6	6.8	14	13	370	280	5.8	4.8	17	15	680	650	8.0	5.8	24	22
18	650	610	8.2	7.2	13	12	390	270	6.2	5.7	16	15	690	660	10.5	6.5	23	22
19	650	640	9.6	7.2	15	13	460	390	6.2	--	16	14	700	670	12.1	6.1	24	22
20	740	640	8.7	6.7	14	13	510	460	--	--	15	14	700	690	14.7	8.8	25	23
21	660	640	9.7	7.9	15	14	530	510	--	--	16	14	710	660	13.8	9.5	25	23
22	660	650	12.9	8.4	16	13	550	530	--	--	17	14	690	650	12.4	9.4	27	24
23	680	660	14.1	10.1	16	14	590	550	--	--	16	15	660	620	11.3	2.8	27	25
24	700	660	12.5	8.6	16	12	610	580	--	--	16	14	700	590	3.1	1.7	27	26
25	690	660	10.3	8.9	12	11	640	610	--	--	17	14	590	450	1.8	1.1	27	24
26	690	650	11.6	8.8	12	11	650	430	--	--	17	16	560	500	1.4	1.1	24	22
27	680	660	15.0	10.0	12	9	460	300	7.0	6.4	16	15	510	440	2.0	1.4	22	20
28	680	650	15.0	11.1	14	11	460	300	6.6	6.2	16	15	440	390	2.7	2.0	20	19
29	680	600	15.0	12.7	15	13	410	380	6.9	6.5	15	14	450	400	3.1	2.8	20	19
30	700	640	15.0	15.0	15	14	430	390	7.1	6.9	16	15	490	450	3.2	3.0	22	19
31	--	--	--	--	--	--	800	430	7.3	7.1	16	15	--	--	--	--	--	--
DAY	JULY						AUGUST						SEPTEMBER					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	500	490	3.1	3.0	23	22	--	--	--	--	--	--	600	560	12.1	8.6	22	21
2	510	500	3.1	3.0	23	22	--	--	--	--	--	--	610	560	13.1	8.9	22	20
3	510	500	3.2	3.0	23	22	--	--	--	--	--	--	620	600	--	--	23	21
4	530	510	3.2	3.1	23	22	--	--	--	--	--	--	630	620	13.5	9.0	23	22
5	530	520	3.3	3.2	23	22	--	--	--	--	--	--	640	620	11.7	8.8	23	22
6	550	530	3.3	3.2	24	22	--	--	--	--	--	--	640	630	--	--	23	22
7	560	550	3.3	3.2	24	22	--	--	--	--	--	--	650	640	--	--	22	21
8	580	560	3.6	3.2	25	23	630	590	6.1	5.0	28	27	640	630	14.0	10.9	22	21
9	590	580	4.2	3.4	26	23	630	530	5.9	5.0	27	26	680	640	13.3	8.3	22	22
10	590	580	4.4	3.5	26	24	530	470	5.2	4.7	28	26	710	680	8.4	5.5	22	21
11	590	580	5.1	3.9	26	23	540	490	6.0	4.4	26	24	720	690	6.6	5.6	21	18
12	620	590	5.3	4.1	27	24	490	390	--	--	24	23	690	680	6.2	5.1	19	17
13	630	580	5.8	4.6	26	25	400	380	--	--	24	23	730	690	5.5	5.1	20	18
14	600	530	5.3	4.1	27	25	430	390	--	--	26	23	750	730	5.3	4.8	21	19
15	590	530	5.0	3.8	27	25	450	430	--	--	26	24	750	730	5.8	3.9	22	20
16	660	590	4.1	2.9	28	26	450	440	--	--	26	24	750	720	10.7	5.2	22	21
17	660	560	3.3	3.0	28	26	440	410	--	--	26	24	720	710	10.4	8.6	22	21
18	560	470	3.0	2.9	27	26	410	360	--	--	24	24	760	720	8.7	6.5	21	19
19	--	--	--	--	--	--	450	370	--	--	25	24	720	710	9.1	5.9	19	18
20	--	--	--	--	--	--	450	430	--	--	26	24	710	560	7.8	4.9	20	18
21	--	--	--	--	--	--	450	420	--	--	27	25	720	570	4.9	4.3	21	19
22	--	--	--	--	--	--	480	450	--	--	28	26	710	670	5.6	4.0	21	21
23	--	--	--	--	--	--	510	480	--	--	28	27	670	630	6.1	4.5	22	21
24	--	--	--	--	--	--	540	510	--	--	28	27	640	620	5.9	4.6	22	22
25	--	--	--	--	--	--	570	540	--	--	28	26	630	570	6.2	4.5	22	20
26	--	--	--	--	--	--	580	570	--	--	25	23	570	510	6.2	5.0	21	18
27	--	--	--	--	--	--	590	570	--	--	23	21	510	500	6.5	5.2	19	17
28	--	--	--	--	--	--	600	590	--	--	22	21	550	500	7.8	5.8	19	16
29	--	--	--	--	--	--	590	580	--	--	22	21	550	540	8.3	6.4	19	17
30	--	--	--	--	--	--	580	560	--	--	22	21	560	550	10.2	7.3	18	16
31	--	--	--	--	--	--	570	560	--	--	22	21	--	--	--	--	--	--

STREAMS TRIBUTARY TO LAKE ERIE

04188200 AUGLAIZE RIVER AT CLOVERDALE, OHIO

LOCATION.--Lat 41°01'08", long 84°17'20", Putnam County, on left bank at old bridge abutment, 0.15 mile upstream from bridge on State Route 114, 2.5 miles upstream from Blanchard River, 4.5 miles downstream from Ottawa River, and 0.8 mile east of Cloverdale.

DRAINAGE AREA.--713 sq mi.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1968.

Water temperatures: June 1967 to September 1968.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum specific conductance and minimum specific conductance of the samples collected each month. From Oct. 1 to Apr. 8 no records are available due to malfunctions of the instrument. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	BICAR- BONATE (MG/3)	CAR- BONATE (C/3)	SULFATE (50/4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO ₃)	DIS- SOLVED SOLIDS (PESI- DUCE (180 C))	HARD- NESS (CA, MG)	NON- FAR- FONATE NESS	SPECI- FIC CON- DUCTANCE (MICRO- MHOS)	pH
OCT.												
13...	12..	172	0	293	95	1.2	54	854	426	285	1.00	7.3
27...	15..	118	26	173	71	.8	7.4	544	262	122	739	8.7
NOV.												
30...	--	172	0	136	52	.6	20	376	276	135	598	7.2
27...	14..	176	0	195	61	.7	56	676	380	236	950	7.4
DEC.												
14...	135^	92	0	50	22	.2	23	258	144	60	333	7.7
19...	172^	186	16	130^	32	.4	37	480	344	165	685	8.6
FEB.												
05...	14..	152	0	79	21	.2	30	338	242	117	479	8.2
26...	130^	244	0	210^	62	.5	87	716	466	266	1220	7.0
MAR.												
02...	10..	198	0	2.5	60	.7	82	692	440	278	1130	5.9
27...	11..	102	0	54	27	.3	29	240	168	84	370	8.2
APR.												
05...	135^	156	0	88	24	.4	36	362	250	122	564	7.4
29...	163^	238	0	162	56	.5	29	588	306	201	877	7.4
MAY												
13...	1130	193	0	194	71	.7	58	642	370	212	1020	--
31...	1840	112	0	57	16	.3	60	292	203	111	447	--
JUNE												
19...	293^	244	0	187	64	.4	18	608	388	178	943	7.0
28...	141^	136	0	60^	14	.4	55	338	215	104	465	7.7
JULY												
12...	165^	188	0	197	66	.7	42	620	380	226	986	--
26...	190^	152	0	62	20	.4	6.2	274	200	76	440	7.7
AUG.												
12...	1700	188	2	54	14	.3	18	286	218	60	460	--
30...	1500	218	0	176	62	.7	70	614	344	188	914	--
SEPT.												
04...	1600	182	0	240^	91	.9	49	732	300	241	1120	--
16...	1900	230	0	153	54	.8	10	560	302	143	860	--

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES APRIL TO SEPTEMBER 1968

DAY	APRIL								MAY							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPER- ATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	pH	DISSOLVED OXYGEN (MG/L)		TEMPER- ATURE (°C)				
	MAX	MIN		MAX	MIN	MAX	MIN			MAX	MIN	MAX	MIN	MAX	MIN	
1	--	--	--	--	--	--	950	900	8.5	8.3	6.0	5.3	18	16		
2	--	--	--	--	--	--	980	910	8.7	8.3	5.4	5.0	19	14		
3	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
4	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
5	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
6	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
7	--	--	--	--	--	--	930	830	8.4	8.1	9.0	8.0	18	17		
8	--	--	--	--	--	--	960	790	8.4	8.0	9.5	7.1	19	16		
9	650	630	--	--	7.7	6.7	14	13	1020	900	8.2	8.0	10.9	6.2		
10	680	640	--	--	7.0	6.5	15	12	950	860	8.3	8.1	6.8	3.7		
11	690	630	--	--	7.6	6.4	14	11	940	900	8.1	8.0	5.3	4.5		
12	730	650	--	--	7.7	6.6	17	13	990	880	8.0	7.8	5.4	3.3		
13	740	680	--	--	8.4	5.0	17	15	1030	900	8.1	7.8	6.2	4.1		
14	760	740	--	--	10.3	5.5	18	16	900	810	8.0	7.8	6.2	4.6		
15	770	750	--	--	6.2	5.4	16	14	820	810	8.0	7.8	6.1	5.3		
16	790	720	--	--	7.0	5.4	16	14	830	820	7.8	7.7	7.6	5.9		
17	800	740	--	--	7.4	6.0	16	13	940	810	7.9	7.7	6.6	4.7		
18	770	700	--	--	6.8	6.2	15	14	970	720	7.9	7.7	7.4	4.7		
19	790	760	--	--	7.0	5.8	15	14	750	680	7.8	7.6	7.5	6.1		
20	810	750	--	--	8.1	5.9	16	14	770	680	7.8	7.6	6.6	4.1		
21	800	730	--	--	8.5	7.2	16	15	790	680	7.8	7.5	5.9	4.7		
22	760	710	--	--	9.1	8.0	16	15	870	710	7.8	7.6	6.1	4.4		
23	770	720	--	--	9.7	6.1	17	15	970	830	7.8	7.6	6.1	3.5		
24	820	760	--	--	8.6	5.9	19	17	810	830	7.9	7.7	--	--		
25	930	790	--	--	9.5	5.9	19	16	930	800	7.9	7.5	--	--		
26	820	760	--	--	9.9	7.5	16	12	810	550	7.9	7.4	--	--		
27	--	--	--	--	--	--	--	--	660	590	7.7	7.4	--	--		
28	--	--	--	--	--	--	--	--	500	430	7.6	7.3	--	--		
29	--	--	--	--	--	--	--	--	430	410	7.6	7.4	--	--		
30	--	--	--	--	--	--	--	--	490	420	7.7	7.5	--	--		
31	--	--	--	--	--	--	--	--	470	390	7.8	7.4	--	--		

04188200 AUGLAIZE RIVER AT CLOVERDALE, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES APRIL TO SEPTEMBER 1968

DAY	JUNE								JULY							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	510	430	7.8	5.9	--	--	18	17	620	540	7.8	6.8	2.3	2.1	24	20
2	640	470	7.9	7.6	--	--	20	16	650	620	7.9	7.0	2.1	2.1	26	24
3	710	560	8.1	7.8	--	--	23	19	670	630	7.9	7.4	2.1	2.0	26	23
4	620	580	8.0	7.7	--	--	21	19	700	650	8.2	7.1	2.1	2.0	25	23
5	720	620	8.1	7.7	--	--	23	21	730	700	8.6	7.8	2.2	2.1	24	23
6	740	700	8.2	8.0	--	--	24	23	740	720	8.7	7.9	2.1	2.0	24	22
7	750	710	8.6	7.8	--	--	27	24	800	740	8.9	8.2	2.1	2.0	25	23
8	950	740	8.6	8.1	--	--	27	25	800	690	9.3	8.8	2.9	2.1	26	24
9	950	740	8.9	8.0	9.4	1.8	29	26	780	640	9.3	8.7	2.5	2.3	27	24
10	820	770	8.9	8.3	9.7	5.7	29	28	780	700	9.4	8.5	2.5	2.2	27	25
11	830	810	8.8	8.5	10.1	5.3	29	28	1090	670	8.9	8.0	2.7	2.2	26	24
12	860	810	8.7	8.2	8.9	5.1	29	28	1130	930	9.1	7.9	3.0	2.5	28	25
13	930	800	8.8	8.6	7.4	4.8	30	25	940	900	8.7	8.0	3.5	2.7	28	26
14	910	860	8.8	6.8	9.4	5.0	26	23	920	680	8.2	7.7	3.3	2.5	28	26
15	890	840	8.8	8.2	9.6	6.7	25	22	680	540	7.7	6.9	3.1	2.5	27	25
16	900	800	8.8	7.9	8.0	5.8	25	23	660	470	7.6	6.7	3.2	2.6	27	24
17	1030	850	8.5	7.5	7.1	4.6	24	23	740	440	7.8	7.4	2.8	2.6	29	27
18	1060	970	8.1	7.7	5.0	2.7	24	22	670	420	7.7	7.3	3.8	2.6	28	27
19	1010	910	8.1	6.8	3.3	2.3	26	22	500	470	7.7	7.2	3.4	2.6	27	26
20	870	740	8.5	7.5	2.8	2.4	26	23	700	500	7.7	6.7	2.6	2.1	28	26
21	880	860	8.7	7.8	2.6	1.9	26	23	730	700	7.7	6.4	2.2	1.8	28	26
22	900	860	9.0	7.4	11.4	2.4	27	25	770	680	7.6	6.9	2.0	1.8	28	26
23	870	850	9.0	7.8	11.2	2.0	26	25	770	680	7.7	6.7	2.0	1.8	28	26
24	910	840	8.9	8.1	8.8	1.5	27	25	780	610	7.5	7.1	1.9	1.4	27	25
25	890	770	8.3	7.5	2.7	1.9	28	26	730	540	7.5	7.3	1.8	1.6	26	25
26	880	510	8.1	7.7	3.4	2.7	26	25	620	390	7.6	7.4	1.8	1.3	26	25
27	600	470	8.1	7.4	3.6	2.0	29	22	500	390	7.4	7.3	2.0	1.7	26	25
28	470	440	7.9	7.7	2.3	2.0	22	20	480	450	7.5	7.4	2.0	1.6	26	24
29	480	440	7.9	7.7	2.2	2.1	20	19	590	470	7.5	7.4	2.0	1.7	25	23
30	540	480	7.8	7.2	2.3	2.2	20	19	550	500	7.6	7.5	1.8	1.2	25	23
31	--	--	--	--	--	--	--	--	700	530	8.1	7.6	3.1	.8	28	23
AUGUST																
SEPTEMBER																
1	610	570	7.6	7.5	1.2	.8	24	23	920	860	8.0	7.8			22	21
2	930	560	7.8	7.5	1.4	.9	26	24	940	830	7.9	7.7			23	20
3	840	560	7.7	7.6	1.3	1.0	25	24	1150	850	7.7	7.5			23	21
4	620	560	7.7	7.6	1.4	1.1	25	24	1150	990	7.6	7.5			24	22
5	580	530	7.6	7.5	1.5	1.1	25	24	1080	870	7.7	7.4			24	22
6	530	450	7.5	7.4	1.7	1.5	27	24	900	810	7.5	7.5			23	22
7	500	470	7.5	7.4	1.8	1.6	27	25	950	810	7.5	7.4			22	21
8	660	490	7.5	7.4	1.8	1.5	27	25	1120	860	7.7	7.3			23	21
9	730	660	7.5	7.5	1.6	1.3	26	26	1000	840	7.7	7.5			23	21
10	700	390	7.6	7.4	1.5	1.3	26	23	850	790	7.6	7.5			22	21
11	390	360	7.6	7.4	1.6	1.3	23	22	1070	820	7.6	7.5			21	18
12	480	390	7.7	7.5	--	--	23	22	1080	920	7.6	7.5			18	17
13	550	460	7.8	7.7	--	--	25	22	1080	950	7.5	7.4			19	18
14	590	530	7.9	7.8	--	--	25	23	1150	900	7.5	7.5			20	18
15	630	580	7.9	7.8	--	--	24	24	960	820	7.6	7.5			21	20
16	710	630	8.1	7.8	--	--	27	24	960	760	7.6	7.5			21	20
17	800	670	8.1	8.0	--	--	27	25	910	830	7.7	7.6			21	20
18	1020	560	8.0	7.8	--	--	26	25	930	870	7.7	7.7			21	19
19	590	470	8.0	7.8	--	--	28	25	870	840	7.7	7.6			21	19
20	520	440	8.1	7.9	--	--	28	26	1220	820	7.8	7.6			21	19
21	650	520	8.4	8.1	--	--	30	27	1220	1050	7.8	7.7			22	20
22	700	630	8.4	8.2	--	--	29	28	1150	950	7.8	7.7			23	21
23	700	630	8.4	8.2	--	--	31	28	1100	690	7.7	7.7			24	21
24	730	660	8.5	8.3	--	--	31	28	1050	840	7.7	7.5			23	22
25	720	690	8.6	8.5	--	--	29	25	1110	1000	7.6	7.5			22	20
26	850	720	8.5	8.4	--	--	25	23	1080	1020	7.7	7.6			20	18
27	890	730	8.6	8.4	--	--	27	21	1100	1010	7.6	7.4			19	17
28	940	780	8.7	8.5	--	--	30	21	1100	840	7.5	6.7			18	16
29	900	770	8.5	8.3	--	--	22	20	880	810	7.5	7.4			17	16
30	930	810	8.3	8.1	--	--	23	20	950	840	7.5	7.4			17	15
31	930	830	8.2	8.0	--	--	22	21	--	--	--	--			--	--

04191500 AUGLAIZE RIVER NEAR DEFIANCE, OHIO

LOCATION.--Lat 41°14'15", long 84°23'57", Defiance County, just above dam at powerplant of Toledo Edison Company, 125 ft upstream from gaging station, 0.2 mile upstream from Jackson ditch, and 3 miles south of Defiance.

DRAINAGE AREA.--2,318 sq mi.

PERIOD OF RECORD.--Chemical analyses: January 1966 to September 1968.
Water temperatures: January 1966 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 1,030 micromhos Jan. 25, 26; minimum daily, 240 micromhos Jan. 30 to Feb. 1.
Water temperatures: Maximum, 30.0°C Aug. 21-24; minimum, 1.0°C on many days during December to March.

Period of record:

Specific conductance: Maximum daily, 1,030 micromhos Jan. 25, 26, 1968; minimum daily, 240 micromhos Jan 30 to Feb. 1, 1968.
Water temperatures: Maximum, 30.0°C Aug. 21-24, 1968; minimum, freezing point on several days during February and December 1966, February and March 1967.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum specific conductance and minimum specific conductance of the samples collected each month. Dissolved oxygen concentrations listed as 15.0 mg/l represent concentrations of 15.0 mg/l or greater, due to instrument limitations. Interruptions in the record were due to malfunctions of the instrument.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	BICAR- BONATE (MCO3)	CAP- RONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (Cl)	FLOU- RIDE (F)
OCT.							
05...	1545	20	162	0	213	64	1.7
31...	1425	54	200	3	173	68	.9
NOV.							
08...	1210	1095	168	0	100	28	.4
22...	1320	688	220	0	151	40	.8
DEC.							
01...	1520	298	219	0	140	40	.5
26...	1505	1390	102	0	49	12	.1
JAN.							
23...	1705	890	290	2	176	46	.7
30...	1600	1940	98	0	35	10	.3
FEB.							
02...	1215	2990	76	0	37	8.7	.1
27...	1130	213	238	18	160	36	.5
MAR.							
05...	1035	264	286	0	183	64	.0
21...	1230	5130	134	0	73	20	.3
APR.							
09...	1545	1820	166	0	79	18	.3
22...	1055	742	210	10	134	34	.5
MAY							
15...	1630	657	238	0	151	40	.8
29...	1745	1880	104	0	44	12	.3
JUNE							
21...	1630	290	236	0	119	28	.5
30...	1700	4640	148	0	50	12	.3
JULY							
15...	1245	910	168	0	107	27	.5
31...	1625	639	156	0	76	19	.4
AUG.							
14...	1620	830	164	0	55	14	.3
21...	1815	639	226	0	104	28	.6
SEPT.							
02...	1750	138	217	0	94	28	.6
30...	1630	102	196	8	152	60	1.1

DATE	NITRATE (NO3)	DIS- SOLVED SOLIDS TRIST- DIENE AT 140 C	HARD- NESS (CA, MG)	NON- CAP- RONATE HARD- NESS	SPECI- FIC CINO- UCTANCF (MICRO- MMS)	PH
OCT.						
05...	40	670	332	188	905	6.9
31...	20	526	367	178	804	8.4
NOV.						
08...	24	352	272	134	586	7.0
22...	24	502	354	174	769	7.2
DEC.						
01...	30	506	350	171	734	7.7
26...	26	232	158	74	334	7.2
JAN.						
23...	34	652	456	215	931	8.3
30...	14	200	134	54	256	8.1
FEB.						
02...	22	190	110	57	259	8.1
27...	32	612	430	205	868	8.7
MAR.						
05...	36	466	386	151	689	7.3
21...	38	344	162	52	488	7.1
APR.						
09...	34	354	260	124	513	7.0
22...	27	478	350	161	744	8.5
MAY						
15...	15	400	350	155	780	7.6
29...	53	258	172	87	378	6.8
JUNE						
21...	18	448	333	139	689	7.5
30...	51	332	228	107	480	7.5
JULY						
15...	25	380	284	146	608	7.5
31...	15	310	218	90	493	7.4
AUG.						
14...	7.7	264	100	54	422	7.5
21...	0.3	422	296	111	642	7.4
SEPT.						
02...	4.9	376	274	96	606	7.6
30...	8.1	502	322	148	788	8.5

STREAMS TRIBUTARY TO LAKE ERIE

O4193500 MAUMEE RIVER AT WATERVILLE, OHIO

LOCATION.--Lat 41°30'00", long 83°42'46", Lucas County, at gaging station at bridge on State Highway 64 at Waterville, 3 miles downstream from Tontogany Creek. Monitor located in water treatment plant about 1,500 ft upstream from bridge.

DRAINAGE AREA.--6,329 sq mi.

PERIOD OF RECORD.--Chemical analyses: March 1950 to February 1952, May 1963 to September 1968.

Water temperatures: March 1950 to September 1968.

Sediment records: April 1950 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 900 micromhos Oct. 27; minimum daily, 260 micromhos Feb. 1, 3, 4.

Dissolved oxygen: Maximum daily, 15.0 mg/l or greater Apr. 28; minimum daily, 3.1 mg/l May 17.

Water temperatures: Maximum, 31.0°C Aug. 24; minimum, freezing point on many days during November to March.

Sediment concentrations: Maximum daily, 1,320 mg/l Dec. 23; minimum daily, 4 mg/l Oct. 15-19.

Sediment loads: Maximum daily, 174,000 tons Dec. 23; minimum daily, 2.7 tons Oct. 15.

Period of record:

Specific conductance (1950-52, 1963-65, 1967-68): Maximum daily, 1,150 micromhos Dec. 19, 1964; minimum daily, 213 micromhos Jan. 30, 1952.

pH (1966-67): Maximum daily, 11.1 Nov. 7, 1966; minimum daily, 6.1 Feb. 6, May 12, 14, 1967.

Dissolved oxygen (1966-68): Maximum daily, 15.0 mg/l or greater Oct. 4, 1966, Jan. 2, 6, 1967, Apr. 28, 1968;

minimum daily, 3.1 mg/l May 17, 1968.

Water temperatures: Maximum, 34.0°C July 1, 1963; minimum, freezing point on many days during winter periods.

Sediment concentrations: Maximum daily, 2,240 mg/l Mar. 26, 1954; minimum daily, 1 mg/l on many days during 1953, 1955 and 1963.

Sediment loads: Maximum daily, 208,000 tons Feb. 12, 1958; minimum daily, less than 0.26 ton Sept. 18, 1955.

REMARKS.--In addition to the continuous recorder, daily samples were collected at this site by a local observer. Partial analyses were made on maximum and minimum specific conductance of samples collected each month. Dissolved oxygen concentrations listed as 15.0 mg/l represent concentrations of 15.0 mg/l or greater, due to instrument limitations. Interruptions in the record were due to malfunctions of the instrument. Flow affected by ice Feb. 12 to Mar. 6. Loads were computed by subdividing day on Oct. 21, Dec. 4, 21, 22, Mar. 17, 26, Apr. 4, May 27, June 25, 26.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFPS)	BICAR- BONATE (MG/D)	CAR- BONATE (MG/D)	SULFATE (MG/L)	CHLO- RIDE (CL)	FLUO- RIDE (F)
OCT.							
01...	1200	240	268	0	110	50	1.1
25...	1500	412	212	8	167	60	1.9
NOV.							
02...	1600	1120	234	0	145	52	1.2
15...	1500	1400	200	0	107	36	.6
DEC.							
01...	1630	1120	228	0	132	32	.4
22...	1600	45300	128	0	35	10	.2
JAN.							
26...	1600	3500	278	0	159	45	.5
31...	1600	52000	92	0	37	10	.2
FEB.							
01...	1600	50100	90	0	38	12	.3
27...	1100	1200	206	14	120	26	.4
MAR.							
15...	1900	1190	260	0	129	38	.6
29...	1500	19800	135	0	61	18	.3
APR.							
06...	1500	21900	143	0	84	13	.1
25...	1500	2660	215	12	111	24	.4
MAY							
15...	1600	1950	228	0	110	30	.5
23...	--	44800	126	0	40	10	.3
JUNE							
01...	1600	21200	144	0	86	14	.3
24...	1600	1420	200	0	112	24	.6
JULY							
01...	1600	0130	154	0	58	16	.3
22...	1600	2160	224	0	104	28	.5
AUG.							
01...	1200	1690	210	0	94	26	.7
21...	1600	3530	159	4	57	16	.4
SEPT.							
07...	1600	248	174	0	68	19	.5
30...	1600	752	244	6	107	30	.8

STREAMS TRIBUTARY TO LAKE ERIE

04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	NITRATE (NO3)	TOTAL PHOS- PHORUS (PO4)	DISE- SOLVED SOLIDS		MPT- MPS (CA,MC)	NON- CAP- MATERIAL MPS	SPECI- FIC CON- CENTR- ATION (MICRO- MOS)	PH
			DIFFUS- IBLE (DIF)	SET- TLING (SET)				
OCT.								
01...	2.0	--	432	274	173	677	7.9	
25...	16	--	544	334	147	866	8.4	
NOV.								
02...	15	--	526	302	135	769	--	
15...	28	--	417	296	132	648	--	
DEC.								
01...	14	--	504	348	141	714	9.0	
22...	12	--	275	145	48	290	7.3	
JAN.								
26...	0.4	--	570	408	177	837	7.4	
31...	11	--	174	100	34	273	7.7	
FEB.								
01...	5.4	--	100	130	56	284	7.9	
27...	21	--	442	322	139	652	8.5	
MAR.								
15...	0.2	--	482	350	135	712	--	
25...	29	--	234	200	84	441	7.5	
APR.								
06...	14	--	264	202	85	403	7.4	
25...	6.4	--	414	290	133	670	8.6	
MAY								
15...	8.3	--	388	250	113	449	7.3	
29...	31	--	224	166	63	348	7.1	
JUNE								
01...	38	--	304	209	91	439	7.6	
24...	3.4	--	374	288	124	500	7.3	
JULY								
01...	41	6.2	230	240	106	490	7.6	
27...	13	0.0	430	304	120	631	--	
AUG.								
01...	5.7	1.1	362	274	100	500	7.9	
21...	4.6	1.7	232	204	67	426	--	
SEPT.								
07...	2.2	0.2	250	212	70	465	8.2	
27...	1.4	1.5	410	318	100	705	--	

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; M, IN NATIVE WATER; P, PIPE; S, SIEVE;
 V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEM- PERA- TURE (C)	DISCHARGE (CFS)	CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE										METH- OD OF ANAL- YSIS	
						PERCENT FINER THAN THE SIZE (IN MILLIMETERS)											
DEC 12 1967	2000		30300	461	37700	72	79	85	91	91	93	95	97	98	100	--	SBWC
DEC 12.....	2000		30300	461	37700	26	44	66	85	86	87	94	99	99	100	--	SBW
DEC 22.....	1630		45600	1470	181000	75	89	95	97	99	100	--	--	--	--	--	SBW
JAN 30 1968	1315		33800	341	31100	63	74	81	86	91	93	96	99	100	--	--	SBWC
MAR 20.....	1235		12700	119	4080	72	86	92	97	97	98	100	--	--	--	--	SBWC
MAY 20.....	1340		7140	196	3780	80	92	96	98	98	99	100	--	--	--	--	SBWC

STREAMS TRIBUTARY TO LAKE ERIE

04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	310	6	5.0	623	14	30	1170	20	92
2	395	6	6.4	1120	23	70	1150	31	94
3	475	7	9.0	2830	41	313	6420	32	555
4	1710	7	32	3440	49	455	14500	93	3870
5	755	8	16	6300	39	453	18900	278	14200
6	243	8	5.2	5530	37	452	20900	316	17800
7	177	10	4.8	5320	35	503	19300	230	12500
8	235	12	7.6	3230	34	297	16900	175	7900
9	378	11	11	2880	33	247	13800	139	5180
10	209	10	5.6	2310	33	206	13600	124	4520
11	235	9	5.7	1560	34	143	27400	364	27100
12	280	8	6.0	1430	34	131	32800	495	43800
13	288	6	4.7	1320	34	121	31600	381	32500
14	310	5	4.2	1710	33	142	26500	283	29200
15	250	4	2.7	1260	32	109	20300	174	9760
16	280	4	3.0	1320	32	114	14800	114	4560
17	415	4	4.5	1430	30	116	12400	78	2610
18	784	4	8.5	2520	29	107	11000	76	2260
19	1330	4	14	7000	28	227	11100	63	1890
20	1620	5	22	3060	28	231	9820	69	1430
21	3200	59	539	3030	28	229	11800	90	3120
22	1880	38	193	3050	26	231	40200	1930	120000
23	917	30	74	2880	27	210	68900	1320	174000
24	1190	27	87	2660	26	187	42200	860	98000
25	1100	26	77	2470	26	173	32400	680	50700
26	599	23	37	2050	24	144	24000	457	29400
27	813	19	42	1930	26	135	17200	322	15000
28	599	15	24	1490	27	109	12700	300	10300
29	755	13	27	1060	28	80	10600	272	7780
30	871	13	31	1130	28	85	8460	229	4230
31	727	14	27	--	--	--	5740	172	3740
TOTAL	23330	--	1335.9	71953	--	6260	579660	--	730283
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	5570	124	1860	51600	278	38700	1100	12	34
2	4650	94	1180	56900	250	38400	1000	12	32
3	3780	78	796	56600	252	38500	1000	12	32
4	3110	69	571	49100	213	27700	950	12	31
5	2800	60	601	37600	175	17800	950	12	31
6	2400	53	343	28900	164	12800	900	12	29
7	2100	47	264	24000	135	8750	938	13	33
8	1900	40	205	18000	113	5490	1046	13	37
9	1800	36	175	14000	91	3440	1220	13	43
10	1700	32	147	17600	74	2120	1180	13	41
11	1600	28	121	8180	62	1370	1180	13	41
12	1600	28	121	6000	42	702	1220	13	43
13	1500	27	109	4400	45	435	1510	13	43
14	1500	27	109	3800	42	431	1170	13	45
15	1400	26	98	3300	38	339	1160	16	50
16	1400	26	98	3000	35	284	1460	18	81
17	1300	25	88	2880	34	227	4720	74	1070
18	1300	25	88	2500	26	176	11400	187	4760
19	1300	25	88	2200	25	148	14000	163	6140
20	1300	25	88	1900	24	123	12500	123	4150
21	2200	34	202	1700	23	106	10700	97	2800
22	1600	28	121	1600	22	95	9630	81	2110
23	1100	23	68	1500	20	81	9450	60	1530
24	1300	25	88	1400	18	68	8180	50	1100
25	2000	32	173	1300	17	60	8910	48	1150
26	3500	47	444	1300	15	53	18400	174	5510
27	3500	47	444	1200	14	45	24700	194	12900
28	3000	45	364	1200	13	42	23900	188	12100
29	11000	68	2020	1100	13	39	18900	157	8610
30	4200	320	36300	--	--	--	13000	124	4390
31	5200	407	57100	--	--	--	10900	94	2800
TOTAL	167210	--	104476	395680	--	198624	217619	--	72198

STREAMS TRIBUTARY TO LAKE ERIE

04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	8100	72	1570	1730	52	243	21600	208	12100
2	5570	57	857	1800	45	219	17800	187	8900
3	4810	46	597	1730	38	177	13700	162	5900
4	14100	435	22600	1470	34	135	10500	109	3090
5	29100	961	75500	1470	31	123	8260	75	1690
6	25700	605	42000	1490	27	109	6130	67	1030
7	17700	353	16900	1560	27	114	4930	50	664
8	12300	260	8630	1680	28	127	4070	48	527
9	6690	187	3380	1590	29	124	3320	37	332
10	6200	126	2110	1360	28	103	2820	30	228
11	5170	89	1240	1510	24	98	2400	29	188
12	4210	67	762	2100	20	113	2000	28	151
13	3500	55	520	2500	20	135	1610	27	117
14	3270	48	424	2500	23	155	1660	26	117
15	3060	43	355	2600	28	197	1420	25	96
16	2950	40	319	7000	69	1300	1330	24	86
17	2930	39	309	2000	52	2820	1310	24	85
18	2880	37	288	15000	814	33000	1380	23	84
19	2700	36	262	10000	408	11000	1400	22	83
20	2650	35	250	7500	211	4270	1100	20	59
21	2850	34	262	5680	138	2120	1100	18	53
22	2670	30	216	4520	105	1280	1140	17	52
23	2880	33	257	3420	84	776	1060	16	46
24	2880	39	303	2930	63	498	1400	16	60
25	2470	47	313	2770	46	344	2370	22	154
26	2250	53	322	3160	40	341	9450	95	2700
27	2450	59	390	22400	574	45700	21000	363	20600
28	2270	61	374	43500	839	98500	21900	395	23400
29	2220	60	360	45400	550	67400	17800	303	14600
30	2100	58	329	39300	373	39600	12700	206	7060
31	--	--	--	28900	242	18900	--	--	--
TOTAL	188630	--	181999	288570	--	355401	198660	--	104436
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	9270	143	3580	1750	46	217	439	26	31
2	6030	110	1790	1450	44	172	669	24	43
3	5440	92	1350	1350	42	153	473	23	29
4	4840	75	980	1400	41	155	451	23	28
5	4070	62	681	1310	39	138	537	23	33
6	3140	52	441	1410	42	160	510	23	32
7	2450	45	298	1810	47	230	306	22	18
8	1870	42	212	2180	46	268	456	22	27
9	1610	40	174	2010	45	244	441	20	24
10	1290	39	136	2320	45	282	517	18	25
11	1240	38	127	4260	94	1080	483	18	23
12	1420	37	142	5270	99	1410	410	17	19
13	1380	37	138	4020	73	792	446	16	19
14	1610	37	161	2770	63	471	413	14	16
15	1800	37	180	2070	58	324	406	14	15
16	1870	39	197	2080	50	281	370	14	14
17	2770	41	307	2260	53	323	335	14	13
18	4040	42	458	3160	63	538	349	14	13
19	3470	40	375	4680	91	1150	488	14	18
20	2520	40	272	4740	97	1240	930	17	43
21	2100	39	221	3600	72	670	1350	20	73
22	2070	39	218	2720	60	441	1570	34	144
23	1780	40	192	2050	55	304	1350	44	160
24	1710	42	194	1560	54	227	1260	41	139
25	1450	45	176	1270	54	185	1080	30	87
26	2090	48	271	813	54	119	764	21	43
27	2630	49	348	724	53	104	752	16	32
28	2880	52	404	624	49	83	752	12	24
29	2920	53	418	584	42	66	752	10	20
30	2560	51	353	504	34	46	752	10	20
31	2180	48	283	476	29	37	--	--	--
TOTAL	86500	--	15077	67207	--	11910	19820	--	1225
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)								7304638	
TOTAL LOAD FOR YEAR (TONS)								1783224.0	

STREAMS TRIBUTARY TO LAKE ERIE

04194022 MAUMEE RIVER AT TOLEDO OVERSEAS TERMINAL DOCK, AT TOLEDO, OHIO

LOCATION.--Lat 41°41'06", long 83°28'35", Lucas County, at Toledo Overseas Terminal dock at Toledo, about 1 mile up-stream from mouth.

PERIOD OF RECORD.--Chemical analyses: October 1962 to September 1968.

REMARKS.--Determinations of suspended solids and dissolved oxygen (DO) furnished by city of Toledo, Division of Sewage Disposal. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OCT.	TIME	SODIUM (NA)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	NITRATE (NO3)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	SUSPENDED SOLIDS
04...	0930	30	170	0	81	47	.4	.82	332	--
13...	0815	--	122	0	58	16	--	--	--	--
23...	0820	4.3	136	6	74	18	29	1.70	350	--
JAN.										
10...	0900	12	166	6	34	22	23	1.0	390	--
FEB.										
07...	0930	5.4	144	0	43	12	22	.66	252	--
MAR.										
06...	0830	--	222	0	108	28	--	--	--	--
12...	1630	--	169	0	71	37	--	--	--	--
13...	1245	21	229	0	113	22	20	1.0	454	--
20...	0830	--	186	0	102	36	--	--	--	--
27...	0930	--	170	0	84	24	--	--	--	--
APR.										
03...	0930	--	146	0	89	20	--	--	--	--
15...	0930	--	143	0	61	16	--	--	--	--
17...	0930	--	176	0	82	22	--	--	--	--
24...	0930	14	216	0	46	22	18	.78	394	--
MAY										
01...	0930	17	216	0	30	26	8.3	.82	388	--
19...	0945	--	192	0	114	32	7.2	--	380	--
22...	0830	--	137	0	55	16	10	--	270	120
24...	0900	--	122	0	53	12	24	--	266	524
JUNE										
05...	0915	--	180	0	61	15	26	--	324	66
12...	0930	--	192	0	71	27	10	--	338	27
14...	0830	22	173	6	43	24	--	1.2	340	26
JULY										
1...	0930	--	158	0	64	22	--	--	--	61
17...	0930	--	178	0	96	22	--	--	--	90
24...	0930	--	184	6	76	24	--	--	--	41
31...	0930	21	214	0	30	28	8.6	1.5	354	51
AUG.										
07...	0930	21	200	0	79	28	7.0	1.8	368	33
14...	0920	--	212	0	79	24	--	--	--	46
21...	1030	--	194	0	75	26	--	--	--	43
24...	0915	--	170	0	58	22	--	--	--	31
SEPT.										
04...	0920	--	164	0	61	26	--	--	--	28
11...	0945	--	152	0	60	24	--	--	--	27
18...	0945	--	152	0	60	28	--	--	--	26
25...	0900	20	176	0	70	28	7.3	1.9	322	32
DATE OCT.	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIAL CONDUCANCE (MICROHMS)	PH	TEMPERATURE (DEG C)	CHLORIDE	DISSOLVED OXYGEN	PERCENT SATURATION	METHYLENE BLUE ACTIVE SUBSTANCE	
04...	206	67	553	7.4	16	50	--	--	.16	
13...	200	100	412	7.5	5	50	--	--	--	
20...	234	112	478	8.4	3	40	--	--	.07	
10...	207	116	534	8.5	1	40	--	--	.08	
FEB.										
07...	162	77	327	7.5	1	50	--	--	.06	
MAR.										
06...	318	126	641	7.5	3	20	--	--	--	
14...	226	88	505	7.4	2	15	--	--	--	
15...	318	138	670	7.5	2	23	--	--	.05	
20...	276	123	618	7.4	7	25	--	--	--	
27...	266	126	559	7.5	4	20	--	--	--	
APR.										
03...	220	101	472	7.4	11	15	--	--	--	
10...	208	94	437	8.2	12	30	--	--	--	
17...	252	108	536	8.0	14	16	--	--	--	
24...	292	114	603	7.5	14	10	--	--	.09	
MAY										
01...	300	123	627	7.4	13	20	--	--	.06	
15...	277	128	602	7.5	18	20	--	--	--	
22...	188	76	411	8.2	16	50	8.0	81	--	
29...	194	46	384	7.2	15	50	7.7	77	--	
JUNE										
05...	228	105	463	7.5	20	40	7.4	80	--	
12...	253	104	526	7.5	26	--	4.1	59	--	
18...	262	112	538	8.5	23	30	2.6	30	--	
JULY										
10...	237	103	524	7.8	23	25	3.4	39	--	
17...	236	90	507	7.5	--	25	1.8	--	--	
24...	254	52	575	8.4	27	30	3.2	40	--	
31...	274	98	610	7.5	26	20	3.0	36	.06	
AUG.										
07...	248	84	562	7.4	27	23	2.2	27	.08	
14...	258	84	562	8.0	26	30	6.2	77	--	
21...	240	81	543	7.5	27	25	4.2	52	--	
28...	204	64	461	7.4	24	25	3.7	44	--	
SEPT.										
04...	200	66	465	7.4	24	25	2.7	32	--	
11...	188	66	457	7.0	22	22	2.4	27	--	
18...	188	66	468	7.1	23	15	1.9	22	--	
25...	218	74	507	8.0	23	25	2.6	30	.07	

STREAMS TRIBUTARY TO LAKE ERIE

04194023 MAUMEE RIVER AT MOUTH, AT U.S. COAST GUARD STATION, AT TOLEDO, OHIO

LOCATION.--Lat 41°41'35", long 83°28'20", on left bank at entrance of channel to U.S. Coast Guard and Toledo Yacht Club, in Bay View Park, across the river from C. and O. docks, and 2,500 ft downstream from Toledo Sewage Disposal plant.

DRAINAGE AREA.--6,608 sq mi.

PERIOD OF RECORD.--Chemical analyses: February 1967 to September 1968.
Water temperatures: February 1967 to September 1968.

EXTREMES.--1987-88:

Specific conductance: Maximum daily, 940 micromhos Nov. 5; minimum daily, 210 micromhos Dec. 23.
Water temperatures: Maximum, 30.0°C Aug. 24; minimum, freezing point Feb. 11-13, 15, 17-21.

Period of record:

Specific conductance: Maximum daily, 940 micromhos Nov. 5, 1967; minimum daily, 210 micromhos Dec. 23, 1967.
Dissolved oxygen (February to September 1967): Maximum daily, 14.4 mg/l Sept. 4, 1967; minimum daily, 0.0 mg/l on many days during June to September 1967.
Water temperatures: Maximum, 30.0°C Aug. 24, 1968; minimum, freezing point Feb. 17-20, 1967, Feb. 11-13, 15, 17-21, 1968.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum and minimum specific conductance of samples collected for period December to September. Interruptions in the record were due to malfunctions of the instrument. Considerable industrial pollution from upstream and Toledo sources and from sewage disposal plant. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO SEPTEMBER 1968

DATE	TIME	9ICAR- BONATE (MCO3)	8ICAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 °)	HARD- NESS (CA,MG)	NON- HARD- NESS	SPECI- FIC CON- DUCTANCE (MICRO- MHOS)	PH
DEC.												
05...	0945	206	0	120	36	.6	31	450	319	150	693	7.9
26...	1045	108	0	46	13	.4	20	226	154	65	331	8.2
JAN.												
02...	1045	140	0	73	14	.3	18	286	147	32	421	7.6
30...	0945	224	0	130	56	.5	9.6	517	325	141	762	7.4
FEB.												
06...	0900	104	0	44	16	.2	22	254	166	81	345	7.2
27...	0845	178	0	88	26	.4	28	422	280	134	594	7.2
MAR.												
07...	0930	162	4	90	30	.4	23	376	266	126	583	8.5
14...	0930	192	0	111	84	.6	15	522	208	50	847	7.0
APR.												
10...	1645	140	0	69	16	.1	28	286	226	112	451	7.6
30...	0945	210	0	105	32	.3	10	422	298	126	659	7.3
MAY												
03...	1245	188	0	106	42	.5	24	438	282	128	698	6.9
30...	0830	136	0	52	16	.3	44	272	200	88	429	7.0
JUNE												
11...	0900	178	0	68	22	.2	25	346	236	90	512	7.4
13...	1500	176	0	68	20	.3	28	352	240	96	518	7.4
JULY												
23...	0845	176	0	66	24	.4	18	338	230	86	503	7.3
30...	0830	212	0	92	32	1.4	13	400	275	101	670	7.4
AUG.												
01...	1030	204	0	87	30	.6	14	376	266	98	600	7.5
28...	1500	160	2	60	24	.5	8.7	292	200	66	468	8.4
SEPT.												
06...	0800	156	0	60	28	.3	7.1	274	190	62	465	7.3
26...	1445	162	0	67	32	.6	14	320	204	75	525	7.0

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER								NOVEMBER							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	560	360					16	13	710	670					12	11
2	550	410					17	14	720	690					13	12
3	550	480					17	15	790	710					13	12
4	550	480					18	16	910	790					13	10
5	560	480					20	17	940	910					10	9
6	520	410					18	14	930	890					9	8
7	500	420					16	14	900	800					8	7
8	660	490					18	16	800	750					8	7
9	690	510					18	16	790	720					8	6
10	650	520					16	15	770	720					8	6
11	610	530					16	14	810	740					8	7
12	610	520					15	14	770	730					8	7
13	620	480					16	14	750	730					8	7
14	600	420					16	14	770	610					8	6
15	540	420					15	14	650	570					6	5
16	570	440					16	14	790	630	10.1	8.9			7	4
17	550	460					17	14	800	500	10.5	8.5			7	4
18	560	500					16	15	770	730	9.6	8.2			8	6
19	650	550					16	15	--	--	--	--			--	--
20	680	630					15	14	--	--	--	--			--	--
21	760	610					14	13	670	640	--	--			5	4
22	750	670					14	13	670	640	--	--			6	4
23	790	720					14	13	660	640	--	--			5	4
24	810	760					15	13	690	650	--	--			6	4
25	810	770					14	12	730	660	--	--			7	4
26	810	690					12	10	--	--	--	--			--	--
27	800	490					12	10	--	--	--	--			--	--
28	820	540					11	8	--	--	--	--			--	--
29	660	570					11	8	--	--	--	--			--	--
30	680	620					10	9	--	--	--	--			--	--
31	690	640					12	10	--	--	--	--			--	--

04194023 MAUMEE RIVER AT MOUTH, AT U.S. COAST GUARD STATION, AT TOLEDO, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DECEMBER									JANUARY								
DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN	MAX	MIN	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN					MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	--	--	--	--	440	390			12.0	10.8	1	1	
2	--	--	--	--	--	--	--	--	430	400			12.3	11.5	1	1	
3	--	--	--	--	--	--	--	--	440	410			12.0	11.2	2	1	
4	--	--	--	--	--	--	--	--	650	440			12.2	10.9	3	1	
5	730	620			11.9	10.4	4	2	570	460			12.2	11.5	2	1	
6	680	500			11.0	10.0	4	3	580	490			11.6	11.2	2	1	
7	600	440			10.4	9.0	6	4	--	--			--	--	--	--	
8	530	430			10.4	9.1	6	4	--	--			--	--	--	--	
9	560	460			10.3	8.3	5	4	--	--			--	--	--	--	
10	560	480			10.5	8.4	4	4	--	--			--	--	--	--	
11	580	530			10.0	8.2	6	4	--	--			--	--	--	--	
12	580	400			9.5	8.8	6	5	--	--			--	--	--	--	
13	450	400			9.2	8.5	6	5	--	--			--	--	--	--	
14	450	410			9.2	8.5	6	5	--	--			--	--	--	--	
15	500	420			9.5	8.4	5	4	--	--			--	--	--	--	
16	560	430			9.8	8.8	5	4	--	--			--	--	--	--	
17	550	450			10.0	8.8	4	3	--	--			--	--	--	--	
18	510	460			10.0	9.1	4	3	--	--			--	--	--	--	
19	540	460			10.2	9.2	4	3	--	--			--	--	--	--	
20	490	460			11.2	9.8	4	3	--	--			--	--	--	--	
21	550	460			11.5	9.6	8	4	--	--			--	--	--	--	
22	500	330			11.5	9.6	7	5	--	--			--	--	--	--	
23	340	210			9.7	9.5	6	5	--	--			--	--	--	--	
24	280	230			10.3	9.6	5	4	--	--			--	--	--	--	
25	370	280			11.0	10.0	4	3	--	--			--	--	--	--	
26	360	290			11.4	10.1	3	1	--	--			--	--	--	--	
27	470	350			11.7	10.6	2	1	--	--			--	--	--	--	
28	410	340			11.7	10.7	2	1	--	--			--	--	--	--	
29	560	370			11.9	10.6	2	1	--	--			--	--	--	--	
30	620	440			10.9	10.8	2	1	--	--			10.6	9.5	1	1	
31	500	390			11.9	9.9	2	1	--	--			10.6	9.0	1	1	

FEBRUARY									MARCH								
DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN	MAX	MIN	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN					MAX	MIN	MAX	MIN	MAX	MIN
1	390	290			10.7	9.5	2	1	690	610			10.7	8.2	5	3	
2	390	290			10.8	8.9	3	2	680	610			10.3	8.7	4	3	
3	320	280			10.6	10.2	3	3	650	610			10.0	8.5	4	3	
4	340	300			11.0	10.2	3	2	670	620			9.5	8.3	4	3	
5	370	310			11.2	10.3	3	2	640	570			9.0	7.8	4	2	
6	360	330			11.2	10.5	3	2	620	550			9.7	8.0	4	2	
7	380	340			11.1	10.0	3	2	600	540			9.6	7.8	3	1	
8	390	330			11.3	10.0	3	2	650	530			9.1	6.5	5	2	
9	500	340			11.5	10.0	3	2	670	610			8.3	7.3	6	4	
10	420	350			11.5	10.7	2	1	700	620			9.4	6.8	6	4	
11	430	380			11.7	9.9	2	0	620	430			10.8	7.4	6	2	
12	440	400			11.9	10.0	1	0	540	400			11.4	8.0	4	2	
13	500	420			11.9	10.5	2	0	650	540			10.4	9.0	4	3	
14	540	440			11.7	10.2	2	1	850	530			12.4	8.0	5	2	
15	500	450			11.6	11.1	2	0	870	470			12.2	8.4	5	1	
16	510	460			11.4	10.3	1	1	800	700			9.4	7.3	6	4	
17	590	450			11.8	9.1	2	0	750	700			10.9	6.8	7	5	
18	570	500			11.6	10.5	1	0	720	680			14.9	8.3	7	4	
19	600	510			11.3	9.8	2	0	730	670			14.9	12.7	7	4	
20	570	520			11.1	10.0	2	0	690	620			12.7	9.9	8	6	
21	610	530			11.1	9.4	2	0	660	540			10.3	9.2	8	7	
22	640	530			11.0	9.2	3	1	600	520			10.5	8.4	7	5	
23	610	550			10.6	9.5	2	1	610	490			10.5	8.5	6	4	
24	560	550			10.2	9.2	2	1	720	520			10.7	9.4	5	4	
25	580	550			10.7	9.5	3	1	790	570			10.8	9.8	7	4	
26	630	560			10.3	8.5	4	2	690	580			10.7	9.2	8	6	
27	680	590			9.6	8.1	4	2	680	520			10.7	9.2	8	6	
28	680	600			10.2	8.4	4	2	390	460			10.3	9.3	9	7	
29	660	610			9.6	8.0	3	3	590	420			10.1	8.9	11	8	
30	--	--			--	--	--	--	510	400			9.5	8.0	12	9	
31	--	--			--	--	--	--	520	390			9.0	7.5	13	11	

STREAMS TRIBUTARY TO LAKE ERIE

04194023 MAUMEE RIVER AT MOUTH, AT U.S. COAST GUARD STATION, AT TOLEDO, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

APRIL										MAY										
DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN			MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN		
1	510	420			8.7	7.3	13	11	680	600			8.0	4.6	14	13				
2	500	450			8.4	7.4	13	11	690	630			7.1	4.3	15	13				
3	590	460			8.0	6.7	13	12	710	640			5.9	4.0	16	14				
4	550	470			8.3	6.7	13	12	660	630			5.8	3.6	16	14				
5	510	410			8.3	7.0	13	11	640	590			7.7	3.5	15	14				
6					8.0	7.0			670	630			6.4	2.7	16	14				
7	440	390			8.2	7.1	11	10	690	560			9.8	1.9	16	14				
8	510	410			8.5	7.3	12	10	720	620			4.2	1.2	17	15				
9	520	410			8.2	6.4	12	10	710	620			3.5	1.5	17	16				
10	500	430			9.1	7.5	12	12	650	600			5.7	.9	18	16				
11	540	460			9.0	7.0	13	12	650	560			7.6	.5	17	16				
12	630	480			9.0	6.4	14	11	630	610			5.2	2.2	18	16				
13	600	490			8.1	6.9	14	12	650	570			6.7	2.7	18	17				
14	610	510			8.3	5.8	14	13	650	570			6.5	3.9	18	17				
15	590	510			8.2	6.6	14	13	720	630			6.8	2.8	19	17				
16	620	520			7.5	5.5	16	13	700	540			10.9	3.9	19	18				
17	600	540			6.8	4.7	15	14	630	540			11.2	6.8	19	17				
18	600	560			6.3	4.7	15	14	680	490			6.8	5.0	18	17				
19	560	560			5.8	3.0	17	14	550	290			6.7	5.3	18	16				
20	600	540			6.2	4.8	16	14	420	270			6.6	5.3	17	16				
21	670	590			5.7	3.5	16	15	450	390			6.4	5.0	17	16				
22	640	580			6.5	3.8	17	15	500	430			7.6	4.3	18	16				
23	660	560			7.5	4.4	17	15	520	430			7.5	4.2	17	16				
24	670	560			9.2	6.2	16	13	500	440			8.7	6.1	17	16				
25	670	530			8.1	6.3	15	12	480	440			8.4	6.8	18	16				
26	670	600			6.8	5.0	14	12	520	460			8.1	5.3	17	17				
27	690	600			7.7	3.8	14	12	570	480			7.0	3.7	17	16				
28	620	580			7.1	4.5	14	13	630	410			7.4	5.7	17	16				
29	710	600			5.9	4.2	14	13	440	340			6.8	6.1	16	15				
30	710	640			6.9	3.8	14	13	430	380			7.1	5.9	16	15				
31	--	--			--	--	--	--	450	380			7.4	6.1	16	15				

JUNE										JULY										
DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		MAX	MIN
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN			MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN		
1	460	410			7.3	5.8	17	16	--	--			--	--	--	--	--	--	--	--
2	540	420			7.5	5.5	17	16	--	--			--	--	--	--	--	--	--	--
3	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
4	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
5	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
6	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
7	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
8	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
9	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
10	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
11	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
12	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
13	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
14	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
15	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
16	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
17	--	--			--	--	--	--	--	--			--	--	--	--	--	--	--	--
18	--	--			--	--	--	--	580	510			--	--	--	--	--	--	28	26
19	--	--			--	--	--	--	570	500			--	--	--	--	--	--	28	27
20	--	--			--	--	--	--	540	500			--	--	--	--	--	--	28	27
21	--	--			--	--	--	--	540	500			--	--	--	--	--	--	28	26
22	--	--			--	--	--	--	590	530			--	--	--	--	--	--	28	27
23	--	--			--	--	--	--	600	550			--	--	--	--	--	--	28	27
24	--	--			--	--	--	--	590	450			--	--	--	--	--	--	28	26
25	--	--			--	--	--	--	560	530			1.9	0.5	--	--	--	--	28	27
26	--	--			--	--	--	--	580	540			3.2	.2	--	--	--	--	28	27
27	--	--			--	--	--	--	600	540			3.2	.1	--	--	--	--	28	26
28	--	--			--	--	--	--	630	580			2.0	.3	--	--	--	--	28	27
29	--	--			--	--	--	--	620	590			1.6	.1	--	--	--	--	28	27
30	--	--			--	--	--	--	660	600			1.2	.2	--	--	--	--	27	26
31	--	--			--	--	--	--	680	620			2.2	.5	--	--	--	--	27	25
					--	--	--	--	690	650			3.6	.1	--	--	--	--	26	25

04194023 MAUMEE RIVER AT MOUTH, AT U.S. COAST GUARD STATION, AT TOLEDO, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Table with columns for DAY, MONTH, SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), pH, DISSOLVED OXYGEN (MG/L), TEMPERATURE (°C), and TEMPERATURE (°C). Rows list data for each day from 1 to 31, with two columns of values for each parameter.

04194030 MAUMEE RIVER AT CENTER C. AND O. RAILROAD DOCK, AT TOLEDO, OHIO

LOCATION.--Lat 41°41'46", long 83°21'39", Lucas County, at mouth at end of center dock of Chesapeake Ohio Railroad coal-loading dock, at Toledo.

PERIOD OF RECORD.--Chemical analyses: June 1962 to September 1968.

REMARKS.--Determinations of suspended solids and dissolved oxygen (DO) furnished by the city of Toledo, Division of Sewage Disposal. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Table with columns for DATE, TIME, SODIUM (NA), RICAP-PONATE (HC(S)), CAP-RONATE (CO3), SULFATE (SO4), CHLORIDE (CL), NITRATE (NO3), TOTAL PHOSPHORUS (PPH4), DISSOLVED SOLIDS (PRES), and SUSPENDED SOLIDS. Rows list chemical analysis data by date and time.

STREAMS TRIBUTARY TO LAKE ERIE

04194030 MAUMEE RIVER AT CENTER C. AND O. RAILROAD DOCK, AT TOLEDO, OHIO--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	HARD-NESS (CA, MG)	NON-CARBONATE HARD-NESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	TEMPERATURE (DEG. C)	COLOR	DISSOLVED OXYGEN	PERCENT SATURATION	METHYLENE BLUE ACTIVE STAINANCE
OCT.									
04...	176	68	451	8.3	14	5	--	--	.09
DEC.									
13...	202	65	424	7.5	6	50	--	--	--
20...	228	110	474	7.7	3	50	--	--	.07
JAN.									
03...	212	96	434	8.3	1	50	--	--	--
17...	240	129	608	7.3	0	35	--	--	.09
FEB.									
07...	190	66	317	8.0	1	50	--	--	--
20...	278	129	587	8.0	2	25	--	--	.14
MAR.									
06...	252	117	590	8.0	3	15	--	--	--
13...	242	123	603	8.3	2	15	--	--	--
30...	278	122	615	8.2	7	44	--	--	.05
27...	264	128	552	7.5	7	17	--	--	--
APR.									
03...	218	100	460	7.5	11	15	--	--	--
10...	202	98	442	8.0	12	30	--	--	--
17...	240	101	520	7.5	14	20	--	--	--
24...	286	115	598	7.4	14	20	--	--	.06
MAY									
01...	245	116	622	7.7	13	10	--	--	.12
15...	266	123	608	8.2	18	15	--	--	--
22...	192	74	424	7.4	17	40	7.2	73	--
28...	180	75	395	7.4	16	40	7.6	75	--
JUNE									
05...	168	44	463	7.4	20	40	7.1	77	--
12...	238	89	512	7.5	26	25	4.0	32	--
19...	245	103	532	7.7	23	--	2.8	32	--
JULY									
10...	222	91	501	7.4	23	23	4.4	53	--
17...	202	56	494	7.4	--	20	1.8	--	--
24...	232	71	514	8.3	27	25	3.0	37	--
31...	278	106	611	8.4	26	22	1.7	21	.03
AUG.									
07...	230	66	555	7.4	27	17	4.1	51	.04
14...	230	79	524	7.4	25	20	4.0	48	--
21...	238	79	545	7.7	27	25	4.4	54	--
28...	190	60	456	7.4	24	25	3.8	45	--
SEPT.									
04...	184	50	454	7.6	23	25	3.6	42	--
11...	176	60	442	7.0	22	20	2.0	32	--
18...	176	52	451	7.1	22	15	2.6	30	.05
25...	176	50	427	7.3	22	15	2.7	31	--

04195600 PORTAGE RIVER AT RAILROAD BRIDGE, AT WOODVILLE, OHIO

LOCATION.--Lat 41°26'58", long 83°21'29", Sandusky County, on right bank at old interurban line bridge abutment, just downstream from railroad bridge, 800 ft downstream from gaging station at Woodville.

DRAINAGE AREA.--428 sq mi.

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

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum and minimum specific conductance of samples collected for period June to September. Interruptions in the record were due to malfunctions of the instrument. Records of discharge are given for Portage River at Woodville.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, JUNE TO SEPTEMBER 1968

DATE	TIME	DISCHARGE (CFS)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	DISSOLVED SOLIDS (RESIDUE AT 180°C)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH
JUNE													
13...	0945	125	204	0	150	53	.3	12	488	340	173	767	8.0
JULY													
17...	1000	131	200	0	104	42	.4	20	466	310	146	694	7.5
AUG.													
09...	1450	53	172	0	112	59	.6	2.9	442	260	119	682	8.0
23...	1920	12	206	0	195	100	.6	11	638	363	194	981	--
SEPT.													
12...	1530	13	222	0	149	81	.6	3.0	568	316	134	866	--
28...	1800	2.1	244	0	188	114	.7	1.7	690	368	168	1070	7.5

STREAMS TRIBUTARY TO LAKE ERIE

04195600 PORTAGE RIVER AT RAILROAD BRIDGE, AT WOODVILLE, OHIO--Continued
 SPECIFIC CONDUCTANCE, PH, AND WATER TEMPERATURES, JUNE TO SEPTEMBER 1968

DAY	JUNE					JULY					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	--	--	--	--	--	--	880	750	--	28 24	
2	--	--	--	--	--	--	820	740	--	27 23	
3	--	--	--	--	--	--	810	830	--	25 19	
4	--	--	--	--	--	--	810	810	--	26 19	
5	--	--	--	--	--	--	760	590	--	26 20	
6	--	--	--	--	--	--	670	500	--	27 20	
7	--	--	--	--	--	--	720	580	--	27 20	
8	--	--	--	--	--	--	780	600	--	27 21	
9	--	--	--	--	--	--	830	390	--	31 22	
10	--	--	--	--	--	--	660	380	--	30 22	
11	--	--	--	--	--	--	720	480	--	28 21	
12	--	--	--	--	--	--	760	430	--	28 22	
13	880	670	--	--	--	--	--	--	--	--	
14	790	690	--	--	--	--	--	--	--	--	
15	770	740	--	--	24 21	--	--	--	--	--	
16	810	750	--	--	24 21	790	700	--	--	--	
17	800	740	--	--	23 19	740	680	--	--	--	
18	820	790	--	--	24 17	750	670	--	--	--	
19	830	760	--	--	26 19	--	--	--	--	--	
20	810	730	--	--	26 19	--	--	--	--	--	
21	800	730	--	--	26 18	--	--	--	--	--	
22	790	700	--	--	--	--	--	--	--	--	
23	850	720	--	--	--	--	--	--	--	--	
24	820	740	--	--	--	--	--	--	--	--	
25	810	760	--	--	26 23	--	--	--	--	--	
26	790	720	--	--	23 19	--	--	--	--	--	
27	770	680	--	--	19 17	--	--	--	--	--	
28	720	700	--	--	17 15	--	--	--	--	--	
29	750	710	--	--	20 16	--	--	--	--	--	
30	770	750	--	--	27 20	--	--	--	--	--	
31	--	--	--	--	--	--	--	--	--	--	
DAY	AUGUST					SEPTEMBER					
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	--	--	--	--	--	--	860	680	8.7	8.1	24 19
2	--	--	--	--	--	--	870	760	8.5	7.7	23 16
3	--	--	--	--	--	--	860	490	8.8	8.1	25 18
4	--	--	--	--	--	--	780	480	8.8	8.0	26 20
5	--	--	--	--	--	--	1030	450	8.6	7.9	25 21
6	--	--	--	--	--	--	1060	920	8.5	7.9	23 19
7	810	700	9.1	7.6	29 25	1000	740	8.4	7.9	24 17	
8	770	580	9.2	8.2	30 26	1050	720	8.6	7.9	24 18	
9	660	590	8.7	7.6	30 24	910	340	8.4	8.2	24 19	
10	700	650	8.6	7.6	29 24	--	--	8.4	8.0	22 19	
11	940	700	8.5	7.9	26 20	--	--	8.5	8.0	--	
12	840	710	8.8	8.4	26 20	880	840	9.1	8.0	21 18	
13	750	700	9.0	8.6	27 21	1020	960	9.0	8.4	23 15	
14	940	740	9.2	8.8	27 22	1030	890	9.0	8.4	24 15	
15	940	750	9.3	8.7	30 22	1030	980	9.0	8.5	25 18	
16	890	790	9.2	8.7	28 24	1070	950	9.1	8.5	25 19	
17	840	730	9.2	8.6	30 24	1030	960	9.0	8.6	23 19	
18	860	750	9.1	8.5	29 23	1070	1000	8.9	8.5	21 19	
19	840	730	9.2	8.4	28 23	1140	1030	8.7	8.4	21 17	
20	820	730	9.2	8.3	31 25	1110	1010	8.7	8.3	24 18	
21	850	790	8.9	8.3	31 26	1170	1070	8.3	7.5	24 19	
22	870	800	8.9	8.2	32 27	1280	1170	8.2	7.4	28 23	
23	940	830	8.8	8.2	33 27	--	--	8.4	7.9	--	
24	970	900	8.8	8.3	33 27	--	--	8.2	7.7	29 23	
25	1000	860	8.9	8.2	32 24	1080	1000	8.4	7.9	23 19	
26	940	850	8.7	8.1	25 20	--	--	8.6	8.4	19	
27	940	820	8.7	8.1	23 17	--	--	--	--	--	
28	920	720	8.7	8.2	24 17	--	--	--	--	--	
29	930	650	8.7	8.3	24 17	--	--	--	--	--	
30	880	790	8.6	8.1	23 18	--	--	--	--	--	
31	910	740	8.6	8.1	24 17	--	--	--	--	--	

04196800 TYMOCREEK CREEK AT CRAWFORD, OHIO—Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, JANUARY TO SEPTEMBER 1968

DAY	FEBRUARY								MARCH							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	300	200	--	--	10.4	9.2	3	2	960	920	8.2	7.9	11.1	9.8	1	1
2	350	240	--	--	9.4	9.2	4	3	960	920	8.1	7.9	10.8	9.5	1	1
3	330	310	--	--	10.0	9.4	6	2	990	940	8.2	7.9	11.7	10.0	1	1
4	370	330	--	--	10.0	9.8	5	1	1000	960	8.3	8.0	12.2	10.1	1	1
5	420	370	7.6	7.5	12.2	6.9	6	0	1000	940	8.4	8.1	12.5	10.3	2	1
6	490	420	7.7	7.5	9.9	7.0	5	0	950	900	8.4	8.0	12.6	10.0	3	1
7	520	490	7.7	7.6	9.8	6.6	6	0	930	890	8.6	8.1	13.1	10.4	4	1
8	570	520	7.8	7.6	9.6	9.4	3	1	900	870	8.6	8.1	12.8	10.4	4	1
9	580	570	7.8	7.7	9.7	9.4	4	0	890	840	8.6	8.1	12.5	10.2	4	2
10	650	580	7.8	7.7	10.2	9.0	3	0	840	780	8.7	8.2	12.8	10.4	4	2
11	670	650	7.8	7.7	9.7	9.4	4	0	800	760	8.8	8.1	12.8	10.4	6	2
12	700	670	7.7	7.6	9.5	9.0	4	0	780	730	8.8	8.4	11.1	10.4	3	1
13	750	690	7.7	7.5	9.9	8.9	3	0	820	730	8.9	8.3	13.1	10.1	2	1
14	770	750	7.7	7.6	9.5	9.1	4	0	840	800	9.0	8.4	14.3	10.8	3	0
15	--	--	--	--	--	--	--	--	1020	820	8.8	8.3	13.2	11.0	2	0
16	--	--	--	--	--	--	--	--	1030	440	8.6	7.8	12.1	10.6	3	1
17	--	--	--	--	--	--	--	--	480	420	7.8	7.6	10.6	10.1	3	1
18	--	--	--	--	--	--	--	--	500	400	7.8	7.6	10.3	10.0	4	2
19	--	--	--	--	--	--	--	--	450	400	7.8	7.6	10.2	9.9	7	4
20	--	--	--	--	--	--	--	--	500	450	7.8	7.7	9.9	9.7	8	7
21	--	--	--	--	--	--	--	--	510	490	7.9	7.8	9.8	9.6	7	6
22	--	--	--	--	--	--	--	--	520	500	8.0	7.9	9.7	9.6	6	2
23	910	880	8.0	7.9	12.4	9.9	1	1	510	500	8.1	8.0	10.2	9.7	3	1
24	920	880	8.0	7.8	10.7	9.6	1	1	520	500	8.1	8.0	11.2	10.0	3	1
25	920	880	8.0	7.8	10.8	9.6	1	1	510	390	8.0	7.7	11.6	10.5	4	2
26	920	890	8.0	7.8	10.8	9.6	1	1	390	320	7.7	7.6	11.7	9.4	6	2
27	930	890	8.0	7.9	10.6	9.4	1	1	330	300	7.6	7.4	11.0	8.0	12	5
28	950	930	8.1	7.9	10.7	9.4	1	1	310	300	7.4	7.2	8.1	7.6	--	11
29	950	910	8.1	7.8	10.2	9.3	1	1	400	310	7.3	7.1	10.6	7.5	--	12
30	--	--	--	--	--	--	--	--	480	400	7.8	7.3	11.2	10.8	13	11
31	--	--	--	--	--	--	--	--	520	480	7.7	7.6	11.2	11.0	13	12

APRIL

MAY

DAY	APRIL								MAY							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	570	520	7.9	7.6	11.5	11.1	13	11	--	--	--	--	--	--	--	--
2	600	570	8.1	7.8	11.7	11.1	12	9	--	--	--	--	--	--	--	--
3	620	600	8.1	8.0	11.5	10.8	12	10	--	--	--	--	--	--	--	--
4	620	510	8.1	7.8	10.9	10.0	13	12	--	--	--	--	--	--	--	--
5	560	480	7.9	7.7	10.7	9.9	12	9	--	--	--	--	--	--	--	--
6	540	470	7.9	7.8	10.8	10.1	10	8	--	--	--	--	--	--	--	--
7	540	480	8.0	7.8	10.8	10.0	11	8	1000	900	7.4	7.2	11.1	7.9	18	13
8	580	540	8.1	7.9	10.4	10.0	13	10	1020	1000	7.4	7.2	9.5	6.6	17	13
9	620	580	8.1	8.0	10.1	9.6	13	11	1000	970	7.4	7.1	9.4	6.0	20	14
10	--	--	--	--	--	--	--	--	1030	990	7.4	7.1	9.5	5.6	19	14
11	--	--	--	--	--	--	--	--	1040	900	7.2	5.9	6.9	5.3	16	14
12	--	--	--	--	--	--	--	--	1020	910	7.0	5.8	6.3	4.9	17	14
13	--	--	--	--	--	--	--	--	910	720	7.1	6.9	7.3	5.0	16	14
14	--	--	--	--	--	--	--	--	720	500	7.0	6.8	8.1	6.8	17	15
15	--	--	--	--	--	--	--	--	580	520	6.9	6.7	7.6	6.8	20	16
16	--	--	--	--	--	--	--	--	610	580	6.9	6.8	7.6	6.6	21	18
17	--	--	--	--	--	--	--	--	630	610	6.8	6.7	8.4	6.8	20	17
18	--	--	--	--	--	--	--	--	630	620	6.9	6.8	8.0	6.7	21	16
19	--	--	--	--	--	--	--	--	680	630	7.0	6.8	8.2	7.0	18	14
20	--	--	--	--	--	--	--	--	700	680	7.2	6.9	9.8	7.5	18	13
21	--	--	--	--	--	--	--	--	750	700	7.4	7.0	11.6	7.9	20	13
22	--	--	--	--	--	--	--	--	730	720	7.5	7.1	13.3	8.2	21	13
23	--	--	--	--	--	--	--	--	760	730	7.2	7.1	10.1	7.5	16	15
24	--	--	--	--	--	--	--	--	770	760	7.2	6.9	10.2	7.1	17	14
25	--	--	--	--	--	--	--	--	780	630	7.0	6.9	9.4	7.5	18	13
26	--	--	--	--	--	--	--	--	630	480	6.9	6.8	7.6	7.0	15	15
27	--	--	--	--	--	--	--	--	490	360	6.8	6.6	7.1	3.6	15	15
28	--	--	--	--	--	--	--	--	440	420	6.6	6.5	3.7	2.8	15	15
29	--	--	--	--	--	--	--	--	420	300	6.5	6.5	3.0	2.3	17	15
30	--	--	--	--	--	--	--	--	380	320	6.5	6.5	3.5	2.6	17	15
31	--	--	--	--	--	--	--	--	500	380	6.6	6.5	3.8	3.3	16	15

STREAMS TRIBUTARY TO LAKE ERIE

04198005 SANDUSKY RIVER BELOW FREMONT, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	DECEMBER							JANUARY								
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	810	760			10.4	9.2	2	2	690	640			13.2	13.0	1	0
2	820	760			10.2	9.5	3	2	750	680			13.5	12.8	1	0
3	790	670			10.3	8.8	3	2	760	710			13.1	12.6	1	0
4	690	420			11.8	10.3	2	1	780	790			13.0	12.5	1	0
5	440	410			13.0	11.5	2	2	825	750			13.1	12.5	1	0
6	460	420			13.0	12.7	2	2	830	760			13.3	12.5	1	1
7	440	410			13.2	12.7	4	2	820	800			13.1	11.9	1	0
8	480	430			12.9	12.7	4	3	--	--			--	--	--	--
9	510	470			13.0	12.9	4	4	--	--			--	--	--	--
10	530	490			13.0	12.7	4	4	--	--			--	--	--	--
11	570	490			12.7	12.5	4	4	--	--			--	--	--	--
12	510	460			12.6	12.4	6	4	--	--			--	--	--	--
13	490	460			12.7	12.6	6	5	--	--			--	--	--	--
14	490	470			12.8	12.6	6	5	--	--			--	--	--	--
15	520	490			13.0	12.7	5	3	--	--			--	--	--	--
16	540	520			13.3	12.8	3	2	--	--			--	--	--	--
17	580	540			13.5	13.0	2	2	--	--			--	--	--	--
18	590	580			13.4	12.7	3	2	--	--			--	--	--	--
19	640	590			12.8	12.3	4	3	--	--			--	--	--	--
20	660	640			13.1	12.5	4	3	--	--			--	--	--	--
21	640	570			12.9	11.9	7	3	--	--			--	--	--	--
22	610	430			13.2	11.9	8	5	--	--			--	--	--	--
23	460	360			13.8	13.2	6	3	--	--			--	--	--	--
24	410	390			13.5	13.3	3	2	--	--			--	--	--	--
25	420	410			13.5	13.3	2	1	--	--			--	--	--	--
26	490	420			13.7	13.5	1	0	--	--			--	--	--	--
27	530	490			13.6	13.4	1	0	--	--			--	--	--	--
28	580	510			13.4	13.2	1	1	--	--			--	--	--	--
29	820	540			13.3	13.2	1	1	430	300			11.7	7.4	1	0
30	630	560			13.3	13.2	1	1	300	220			11.9	6.6	1	0
31	650	610			13.2	13.0	1	0	260	220			10.5	7.2	1	1
	FEBRUARY							MARCH								
DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1																
2									--	--			--	--	--	--
3									--	--			--	--	--	--
4									--	--			--	--	--	--
5									--	--			--	--	--	--
6									--	--			--	--	--	--
7									--	--			--	--	--	--
8									--	--			--	--	--	--
9									--	--			--	--	--	--
10									--	--			--	--	--	--
11									--	--			--	--	--	--
12									--	--			--	--	--	--
13									--	--			--	--	--	--
14									--	--			--	--	--	--
15									--	--			--	--	--	--
16									--	--			--	--	--	--
17									--	--			--	--	--	--
18									--	--			--	--	--	--
19									--	--			--	--	--	--
20									--	--			--	--	--	--
21									540	510			11.0	10.9	8	7
22									570	540			11.5	11.0	7	4
23									580	570			12.6	11.5	4	3
24									630	570			13.2	12.4	5	2
25									650	620			13.1	12.4	6	3
26									690	420			13.2	12.4	6	3
27									420	350			13.2	12.4	6	4
28									390	360			12.4	11.5	9	6
29									380	350			11.5	10.6	12	8
30									410	360			10.7	10.1	13	10
31									440	400			10.1	9.2	13	11

04198005 SANDUSKY RIVER BELOW FREMONT, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL						MAY							
	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN		MAX	MIN		MAX	MIN		MAX	MIN		MAX	MIN
1	550	440			10.3	9.2	13	11	750	700	12.2	9.0	17	13
2	580	540			10.6	9.8	13	9	740	710	14.9	10.1	19	14
3	580	560			10.4	9.5	13	10	750	690	12.2	9.0	19	14
4	640	570			10.2	9.1	15	11	720	680	11.0	7.7	18	16
5	660	560			10.3	9.2	13	10	720	640	8.9	6.4	17	16
6	590	550			11.1	10.3	11	9	740	700	10.3	6.0	17	14
7	580	540			10.8	10.4	11	9	740	710	11.9	8.5	16	14
8	570	550			10.4	9.3	12	9	760	700	9.9	7.5	17	14
9	580	560			10.3	9.3	12	11	740	660	8.7	6.7	16	14
10	660	530			9.9	9.0	13	11	740	640	12.4	6.6	19	16
11	680	650			10.1	9.4	13	10	760	660	10.7	6.5	19	17
12	650	630			10.2	9.5	16	11	780	680	7.3	4.7	17	14
13	640	630			10.5	9.3	16	12	760	720	9.6	5.9	17	15
14	720	620			10.5	9.0	17	13	760	700	8.6	6.3	18	16
15	700	620			11.6	7.1	17	12	740	680	7.2	5.6	19	16
16	740	670			14.6	10.1	17	13	720	670	6.4	4.8	20	18
17	720	630			14.3	10.9	17	12	710	650	6.0	4.7	19	16
18	740	650			12.9	8.9	16	12	740	660	8.2	4.3	21	16
19	740	660			15.0	10.8	18	13	730	680	8.3	6.1	20	16
20	730	600			14.9	9.3	18	13	740	680	7.5	6.5	19	15
21	730	680			9.5	8.0	18	14	710	680	8.5	6.0	19	14
22	730	680			12.7	7.3	19	14	680	520	14.1	7.5	21	18
23	750	650			12.8	7.3	18	16	570	450	12.2	8.4	21	18
24	710	660			7.3	6.0	17	13	600	520	8.4	6.3	19	16
25	710	650			7.4	6.6	18	11	710	560	11.6	6.7	20	18
26	750	700			8.9	6.7	11	10	600	470	11.5	7.7	19	17
27	780	710			11.3	7.6	12	9	670	540	7.7	4.6	17	16
28	780	670			14.3	9.3	15	11	660	530	7.4	6.1	17	16
29	730	680			12.3	9.6	14	12	540	460	7.6	7.4	17	16
30	710	660			12.0	8.3	14	12	460	440	7.6	7.5	17	16
31	--	--			--	--	--	--	460	440	7.7	7.3	18	14
DAY	JUNE						JULY							
	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN		MAX	MIN		MAX	MIN		MAX	MIN		MAX	MIN
1	470	410			7.7	7.3	18	17	640	600	7.4	4.8	24	22
2	500	430			7.3	6.2	19	16	650	610	7.7	4.3	24	23
3	530	490			6.3	5.8	18	16	650	630	8.3	5.8	23	22
4	570	530			6.2	5.7	19	16	630	580	14.9	8.3	24	22
5	660	570			6.2	5.1	20	18	660	570	15.0	12.6	23	22
6	670	650			6.4	4.9	23	20	640	540	15.0	13.2	25	22
7	660	620			7.5	5.3	26	23	590	540	--	--	24	23
8	690	590			13.9	4.5	28	24	620	550	15.0	--	25	23
9	640	570			--	--	30	23	610	510	14.4	9.7	26	23
10	620	550			--	--	30	24	600	500	12.9	8.8	25	23
11	610	550			--	--	30	27	580	540	11.7	7.1	27	24
12	630	580			11.9	6.6	30	24	590	550	10.8	7.0	27	24
13	680	610			10.6	3.3	27	22	600	550	9.4	5.6	27	24
14	690	580			15.0	8.8	26	22	630	560	8.0	5.0	26	24
15	630	570			13.4	8.0	26	21	590	570	7.4	5.0	26	24
16	690	520			13.2	7.5	26	22	630	590	5.0	1.0	26	24
17	630	560			11.9	8.3	25	23	720	630	10.8	1.4	26	23
18	660	580			12.6	6.5	24	22	680	500	9.6	3.9	26	25
19	690	620			8.5	4.5	23	20	630	500	7.8	2.5	26	25
20	730	680			6.9	4.4	23	21	580	370	6.6	5.2	26	23
21	730	710			9.2	5.3	23	22	510	420	7.2	5.4	25	23
22	720	700			7.2	4.8	23	21	500	490	6.6	4.5	26	24
23	740	590			11.3	5.6	26	23	490	440	5.2	2.8	26	24
24	700	610			9.9	4.6	25	23	440	380	5.3	1.5	26	24
25	660	610			8.0	1.5	25	23	480	420	8.0	2.2	26	24
26	730	640			5.7	.2	24	22	540	460	8.8	2.5	27	23
27	730	630			6.7	5.1	22	20	520	480	10.0	3.2	27	24
28	720	600			7.9	6.1	22	19	610	520	19.5	3.8	28	24
29	600	560			6.9	6.4	20	18	620	580	15.0	4.3	28	23
30	620	560			7.1	6.1	22	18	680	620	15.0	4.7	27	22
31	--	--			--	--	--	--	620	570	14.0	7.8	27	23

STREAMS TRIBUTARY TO LAKE ERIE

04198005 SANDUSKY RIVER BELOW FREMONT, OHIO--Continued

SPECIFIC CONDUCTANCE, PH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	AUGUST								SEPTEMBER							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	640	500			12.4	6.5	28	22	680	610			6.5	5.5	23	22
2	530	500			11.4	6.3	27	23	730	660			5.6	3.4	23	22
3	540	480			8.2	5.7	24	23	740	640			4.8	2.1	23	21
4	570	450			8.0	4.6	24	23	760	610			9.1	2.9	24	22
5	600	570			8.6	5.5	25	23	710	640			7.1	2.2	23	23
6	590	500			7.5	5.5	26	24	730	630			3.8	.2	23	23
7	630	580			8.8	5.8	26	24	760	720			5.2	.4	23	22
8	620	560			8.3	5.4	27	25	770	730			6.1	.5	23	22
9	640	540			7.7	1.6	27	25	760	730			5.7	1.3	23	22
10	690	570			9.3	4.3	28	26	750	720			3.3	.0	22	22
11	730	670			7.1	3.1	26	24	730	670			.6	.0	22	21
12	720	650			8.3	5.6	25	23	760	670			8.5	.0	23	21
13	690	620			11.8	5.5	24	23	780	740			5.6	.7	22	20
14	690	630			11.2	5.3	24	23	780	740			7.6	2.7	22	21
15	680	550			14.9	8.0	28	24	770	630			10.7	4.2	25	21
16	580	500			12.6	7.4	28	25	800	720			9.2	3.3	26	21
17	590	500			7.4	2.7	26	24	810	780			6.4	3.5	22	21
18	590	540			6.3	3.3	26	24	790	720			4.7	2.1	22	21
19	560	520			7.5	4.3	26	25	780	710			2.1	.4	22	21
20	560	510			6.0	2.8	27	26	830	780			1.1	.0	22	21
21	560	520			3.9	1.5	27	26	850	810			.0	.0	23	22
22	620	560			5.3	.2	28	26	820	800			.0	.0	23	21
23	630	610			3.8	.4	28	27	830	790			6.6	.0	23	22
24	620	570			5.0	.4	28	28	810	740			.0	.0	23	22
25	640	590			3.4	.0	28	26	790	730			.0	.0	22	21
26	640	620			.0	.0	26	25	820	790			.0	.0	22	21
27	640	610			.0	.0	25	23	840	800			.0	.0	21	20
28	650	610			1.1	.0	24	23	840	820			.0	.0	21	20
29	660	580			9.1	.0	24	23	860	720			.0	.0	20	19
30	640	570			10.0	4.0	27	23	890	850			.0	.0	--	--
31	660	620			8.6	5.3	23	22	--	--			--	--	--	--

04199100 HURON RIVER BELOW MILAN, OHIO

LOCATION.--Lat 41°20'06", long 82°34'38", Erie County on right bank at downstream side of bridge on Mason Road, 3.5 miles northeast of Milan, and 4.2 miles downstream from gaging station at Milan.

DRAINAGE AREA.--385 sq mi.

PERIOD OF RECORD.--Chemical analyses: June to September 1968.

Water temperatures: June to September 1968.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum specific conductance and minimum specific conductance of the samples collected for the period June to September. Interruptions in the record were due to malfunctions of the instrument. Records of discharge are given for Huron River at Milan (drainage area 371 sq mi).

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, JUNE TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	BICAR-ONATE (HCO3)	CAR-ONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (RESI-180 C)	HARD-NESS (CA, MG)	NON-CAR-ONATE HARD-NESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
JUNE														
11...	1445	406	192	0	187	21	.3	3.2	--	476	345	187	698	7.4
13...	1205	188	122	0	98	16	.3	16	--	298	212	112	466	--
JULY														
19...	0915	121	214	0	178	36	.3	4.2	1.6	520	360	184	748	7.7
29...	1215	35	184	0	125	28	.3	11	1.5	404	246	135	622	7.5
AUG.														
02...	2145	35	188	4	142	33	.3	1.7	1.3	390	306	145	675	8.3
09...	1900	1120	114	0	62	14	.4	3.8	.38	198	159	64	365	8.2
SEPT.														
13...	1830	56	164	0	116	19	.3	6.3	.74	348	264	129	544	7.5
25...	1200	26	210	0	103	48	.4	2.9	2.2	536	374	202	862	--

04199100 HURON RIVER BELOW MILAN, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, JUNE AND SEPTEMBER 1968

DAY	JUNE						SEPTEMBER									
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	800	600	--	--	--	--	25	23	--	--	--	--	--	--	--	--
7	740	650	--	--	--	--	27	23	--	--	--	--	--	--	--	--
8	760	680	--	--	--	--	28	25	--	--	--	--	--	--	--	--
9	740	650	--	--	--	--	28	25	--	--	--	--	--	--	--	--
10	660	620	--	--	--	--	28	26	--	--	--	--	--	--	--	--
11	700	400	--	--	--	--	27	26	--	--	--	--	--	--	--	--
12	500	370	--	--	--	--	26	23	--	--	--	--	--	--	--	--
13	560	370	7.6	7.5	6.9	6.0	24	20	--	--	--	--	--	--	--	--
14	640	560	7.7	7.6	7.9	6.9	22	20	--	--	--	--	--	--	--	--
15	640	620	8.0	7.6	9.4	7.9	24	20	--	--	--	--	--	--	--	--
16	640	610	7.9	7.6	8.3	6.4	24	21	--	--	--	--	--	--	--	--
17	620	590	7.9	7.6	7.5	6.4	23	20	--	--	--	--	--	--	--	--
18	640	610	7.8	7.6	8.5	7.5	21	19	--	--	--	--	--	--	--	--
19	660	640	8.0	7.7	9.0	8.0	23	19	--	--	--	--	--	--	--	--
20	680	650	8.3	8.0	9.9	7.7	24	22	--	--	--	--	--	--	--	--
21	650	540	8.7	8.3	12.4	9.6	24	22	--	--	--	--	--	--	--	--
22	670	340	8.7	8.4	11.8	6.7	25	23	--	--	--	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25	--	--	--	--	--	--	--	--	860	840	8.1	7.8	6.6	5.4	24	23
26	--	--	--	--	--	--	--	--	890	850	8.0	7.8	7.0	4.8	23	21
27	--	--	--	--	--	--	--	--	880	840	8.2	7.8	7.4	5.1	22	20
28	--	--	--	--	--	--	--	--	900	860	8.1	7.8	6.6	5.3	22	20
29	--	--	--	--	--	--	--	--	910	890	8.3	7.9	8.5	5.6	20	19
30	--	--	--	--	--	--	--	--	950	900	8.2	8.0	9.1	7.0	20	17
31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

04200500 BLACK RIVER AT ELYRIA, OHIO

LOCATION.--Lat 41°22'50", long 82°06'15", in T.6 N., R.17 W., Lorain County, at gaging station in Cascade Park at Elyria, 0.8 mile downstream from confluence of East and West Branches.

DRAINAGE AREA.--396 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1962 to September 1968.
Water temperatures: October 1962 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 1,670 micromhos Sept. 3; minimum daily, 304 micromhos Feb. 5.
Water temperatures: Maximum, 28.0°C Aug. 6, 8-10; minimum, 1.0°C on many days during January to March.

Period of record:

Specific conductance: Maximum daily, 2,550 micromhos Oct. 10, 1966; minimum daily, 215 micromhos Mar. 13, 1963.
Water temperatures: Maximum, 28.0°C Aug. 6, 8-10, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--Samples for iron and manganese were filtered clear when collected. Daily samples were collected at this station and samples were selected for analysis on the following basis: (1) Maximum daily specific conductance for each month, (2) minimum daily specific conductance for each month, (3) median daily specific conductance for each month, and (4) special sample each month to further define the quality of water. Some regulation at low flow for industrial use.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	ZINC-CHARGE (CF5)	IRON (FE)	MANGANESE (MN)	BICARBONATE (HCO3)	CARBONATE (CO3)	SILFATP (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)
OCT.										
03...	1400	15	--	--	92	0	304	92	.7	53
14...	1040	13	.27	.20	--	--	--	--	--	--
26...	1400	11	--	--	0	0	198	130	.8	2.6
30...	1490	11	--	--	6	0	262	91	.9	23
NOV.										
04...	0830	45	--	--	4	0	262	85	.8	20
10...	1400	17	--	--	92	0	238	150	.7	61
11...	1130	16	.69	.22	--	--	--	--	--	--
23...	1000	38	--	--	176	0	228	148	.6	16
DEC.										
09...	1045	126	.57	.05	--	--	--	--	--	--
10...	0900	104	--	--	108	0	190	81	.4	32
23...	0900	489	--	--	118	0	158	66	.4	32
24...	1100	70	--	--	116	0	225	106	.5	52
JAN.										
04...	0900	26	--	--	68	0	245	178	.5	45
13...	1125	23	.51	.13	--	--	--	--	--	--
22...	1400	56	--	--	114	0	238	178	.5	48
31...	1400	9690	--	--	56	0	59	16	.3	13
FEB.										
05...	1030	614	--	--	52	0	57	17	.3	15
06...	1400	435	--	--	160	0	223	163	.5	6.4
10...	1100	72	1.1	.11	--	--	--	--	--	--
18...	0400	70	--	--	108	0	240	104	.6	47

STREAMS TRIBUTARY TO LAKE ERIE

04200500 BLACK RIVER AT ELYRIA, OHIO--Continued
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	IRON (FE)	MAN- GANESE (MN)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
MAR.										
01...	0900	34	--	--	156	0	286	95	.5	35
09...	1115	128	.72	.18	--	--	--	--	--	--
13...	0900	142	--	--	38	0	158	103	.4	63
29...	1100	840	--	--	80	0	87	28	.3	17
APR.										
01...	0900	262	--	--	80	0	89	28	.3	8.2
06...	1115	507	.62	.07	--	--	--	--	--	--
11...	1500	115	--	--	126	0	156	42	.5	7.4
14...	0900	81	--	--	120	0	221	52	.4	3.4
MAY										
08...	1506	75	--	--	116	0	165	90	.7	11
11...	2000	238	.52	.14	--	--	--	--	--	--
12...	0900	572	--	--	102	0	114	32	.4	7.5
26...	0900	335	--	--	144	0	127	46	.5	8.8
JULY										
12...	0945	30	.09	.13	--	--	--	--	--	--
16...	1600	58	--	--	52	0	138	93	.5	60
26...	1400	74	--	--	92	0	103	47	.5	27
28...	1000	29	--	--	56	0	170	136	.9	68
AUG.										
05...	1400	29	--	--	84	0	188	98	.6	55
08...	1130	16	.17	.20	--	--	--	--	--	--
11...	0800	12	--	--	78	0	258	191	.4	44
20...	1400	26	--	--	94	0	260	119	.6	40
SEPT.										
03...	1100	18	--	--	250	0	240	255	1.0	.6
05...	1030	22	.30	.16	--	--	--	--	--	--
12...	1600	56	--	--	131	0	144	55	.6	18
20...	1400	14	--	--	64	0	240	106	1.0	52

DATE	TOTAL PHOS- PHOS (PO4)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	HARD- NESS (CA,MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	TEMP- ERATURE (DEG C)	DISS- OLVED OXYGEN	PER- CENT SATUR- ATION
OCT.									
03...	--	786	280	205	1170	6.5	16	--	--
14...	--	--	--	--	--	--	--	4.2	38
26...	--	778	276	276	1380	3.6	11	--	--
30...	--	602	234	229	938	6.0	10	--	--
NOV.									
04...	.06	598	232	229	933	5.1	9	--	--
10...	.83	808	306	231	1310	6.5	7	--	--
11...	--	--	--	--	--	--	--	7.0	64
23...	1.2	790	346	202	1250	7.4	3	--	--
DEC.									
09...	--	--	--	--	--	--	--	11.0	85
10...	.94	536	314	225	866	6.9	4	--	--
23...	.90	462	278	181	774	7.2	6	--	--
28...	1.1	672	322	227	1070	6.8	3	--	--
JAN.									
08...	.13	814	338	282	1300	7.2	1	--	--
13...	--	--	--	--	--	--	--	12.0	86
22...	.10	778	342	248	1370	6.6	1	--	--
31...	.32	180	116	70	318	6.9	1	--	--
FEB.									
05...	.25	205	133	90	304	8.0	1	--	--
06...	.57	841	388	257	1270	7.9	1	--	--
10...	--	--	--	--	--	--	--	13.0	89
18...	.86	704	390	301	1070	8.1	1	--	--
MAR.									
01...	.14	766	404	276	1170	7.2	1	--	--
09...	--	--	--	--	--	--	--	12.0	89
13...	.23	560	270	239	838	7.6	1	--	--
29...	.27	262	170	104	431	8.0	2	--	--
APR.									
01...	.42	286	168	103	432	7.2	2	--	--
06...	--	--	--	--	--	--	--	11.0	95
11...	.23	426	272	169	672	7.2	10	--	--
14...	.13	524	314	215	815	7.3	--	--	--
MAY									
08...	.54	512	282	187	901	7.4	16	--	--
11...	--	--	--	--	--	--	15	9.3	92
12...	.66	284	206	123	524	7.4	16	--	--
26...	.34	380	252	134	662	7.6	17	--	--
JULY									
12...	--	--	--	--	--	--	--	4.0	47
16...	.61	516	223	181	792	6.4	26	--	--
26...	.35	366	184	117	562	7.1	27	--	--
28...	.72	620	232	186	1060	6.2	26	--	--
AUG.									
05...	.92	604	269	200	932	7.5	27	--	--
08...	--	--	--	--	--	--	26	2.8	34
11...	.42	750	258	194	1440	6.4	27	--	--
20...	.92	688	290	213	1180	6.6	27	--	--
SEPT.									
03...	.56	854	310	105	1670	7.4	--	--	--
05...	--	--	--	--	--	--	23	3.7	42
12...	1.0	444	234	127	705	7.7	24	--	--
20...	5.0	666	302	249	1060	6.4	24	--	--

STREAMS TRIBUTARY TO LAKE ERIE

04200500 BLACK RIVER AT ELYRIA, OHIO--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	1180	958	--	1070	--	1170	432	776	--	607	979	1560
2.....	1180	948	--	1060	370	1160	432	775	--	607	956	1640
3.....	1170	948	--	1060	315	1140	626	775	--	602	971	1670
4.....	1170	933	--	1070	309	1130	627	775	--	598	932	1350
5.....	1170	945	--	1070	304	1150	628	873	--	599	932	1300
6.....	1150	1300	--	1060	1270	1150	628	895	--	852	932	796
7.....	1170	1270	--	1070	1260	1150	674	899	--	868	--	773
8.....	1170	1300	--	1300	1250	1130	673	901	--	900	1150	733
9.....	1170	1280	860	1320	1250	876	673	882	--	898	1150	719
10.....	1170	1310	866	1300	1250	880	670	886	--	896	1150	830
11.....	1170	1310	866	1340	961	868	672	873	--	893	1440	750
12.....	1170	1250	864	1340	959	876	676	524	--	792	1440	705
13.....	1170	1300	866	1310	954	838	675	526	--	792	1400	751
14.....	1170	1280	868	1320	959	846	815	525	--	802	1390	746
15.....	1170	1300	866	1300	956	838	813	525	--	808	1400	740
16.....	1010	1300	864	1360	961	864	812	525	--	792	1400	724
17.....	1010	1300	775	1360	961	858	812	526	--	835	1430	966
18.....	1010	1240	774	1320	1070	564	812	601	--	839	1200	961
19.....	1000	1240	--	1320	1070	564	813	601	--	795	1080	961
20.....	1000	1250	775	1350	1060	563	618	602	--	790	1180	1060
21.....	1020	1240	775	1350	1070	564	618	602	--	790	1170	1070
22.....	1010	1260	775	1370	1070	565	618	602	--	560	1170	1250
23.....	1000	1250	774	1270	1080	565	618	602	--	575	1180	1190
24.....	1360	1240	1060	1260	1070	570	618	598	--	566	1130	1370
25.....	1370	1240	1060	1320	1070	434	618	602	--	567	1200	1370
26.....	1380	1240	1060	1300	1160	433	618	662	--	562	1200	1360
27.....	1310	1240	1060	1320	1190	432	780	662	--	571	1200	1370
28.....	1320	1250	1070	1340	1160	432	779	664	--	1060	1200	1370
29.....	950	1240	1060	1320	1150	431	780	660	--	1050	1200	1370
30.....	938	1240	1060	1320	--	431	780	664	--	1060	1230	1240
31.....	938	--	1060	318	--	432	--	662	--	1060	1280	--
AVERAGE	1130	1210	--	1230	978	771	680	695	--	773	1190	1099

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	11.0	---	2.0	---	1.0	2.0	14.0	---	21.0	26.0	26.0
2	14.0	11.0	---	2.0	1.0	1.0	2.0	14.0	---	21.0	26.0	26.0
3	14.0	11.0	---	2.0	1.0	1.0	4.0	15.0	---	21.0	27.0	---
4	14.0	9.0	---	2.0	1.0	1.0	4.0	14.0	---	21.0	27.0	26.0
5	15.0	8.0	---	2.0	1.0	1.0	6.0	16.0	---	21.0	27.0	26.0
6	16.0	8.0	---	2.0	1.0	1.0	7.0	16.0	---	22.0	28.0	26.0
7	16.0	8.0	---	2.0	1.0	1.0	9.0	16.0	---	22.0	---	26.0
8	16.0	7.0	---	1.0	1.0	1.0	9.0	16.0	---	23.0	28.0	26.0
9	16.0	7.0	4.0	1.0	1.0	1.0	9.0	16.0	---	23.0	28.0	26.0
10	15.0	7.0	6.0	1.0	1.0	1.0	9.0	16.0	---	24.0	28.0	26.0
11	15.0	7.0	6.0	1.0	1.0	1.0	10.0	16.0	---	24.0	27.0	24.0
12	14.0	7.0	6.0	1.0	1.0	1.0	10.0	16.0	---	24.0	27.0	24.0
13	14.0	6.0	6.0	1.0	1.0	1.0	11.0	16.0	---	24.0	27.0	24.0
14	13.0	6.0	6.0	1.0	1.0	1.0	---	16.0	---	24.0	27.0	24.0
15	13.0	6.0	6.0	1.0	1.0	2.0	12.0	16.0	---	25.0	27.0	24.0
16	12.0	5.0	6.0	1.0	1.0	2.0	12.0	17.0	---	26.0	27.0	24.0
17	12.0	5.0	6.0	1.0	1.0	1.0	12.0	17.0	---	26.0	27.0	24.0
18	12.0	4.0	6.0	1.0	1.0	1.0	12.0	16.0	---	26.0	27.0	24.0
19	12.0	4.0	---	1.0	1.0	1.0	12.0	17.0	---	26.0	27.0	24.0
20	12.0	4.0	6.0	1.0	1.0	1.0	12.0	17.0	---	26.0	27.0	24.0
21	12.0	3.0	6.0	1.0	1.0	1.0	12.0	17.0	---	27.0	27.0	24.0
22	12.0	3.0	6.0	1.0	1.0	2.0	12.0	17.0	---	27.0	27.0	23.0
23	12.0	3.0	4.0	1.0	1.0	2.0	12.0	17.0	---	27.0	27.0	23.0
24	11.0	4.0	5.0	1.0	1.0	2.0	12.0	17.0	---	27.0	27.0	23.0
25	11.0	3.0	5.0	1.0	1.0	2.0	12.0	17.0	---	27.0	27.0	23.0
26	11.0	3.0	4.0	1.0	1.0	2.0	12.0	17.0	---	27.0	27.0	23.0
27	10.0	3.0	4.0	1.0	1.0	2.0	12.0	18.0	---	27.0	26.0	23.0
28	9.0	2.0	3.0	1.0	1.0	2.0	13.0	18.0	---	26.0	26.0	23.0
29	10.0	2.0	3.0	1.0	1.0	2.0	13.0	18.0	---	26.0	26.0	22.0
30	10.0	2.0	3.0	1.0	---	2.0	13.0	18.0	---	26.0	26.0	21.0
31	10.0	---	3.0	1.0	---	2.0	---	18.0	---	26.0	26.0	---
AVERAGE	13.0	5.5	---	1.0	1.0	1.5	13.0	16.5	---	24.5	27.0	24.0

STREAMS TRIBUTARY TO LAKE ERIE
04200550 BLACK RIVER BELOW ELYRIA, OHIO

LOCATION.--Lat 41°24'42", long 82°05'45", Lorain County, at Ford Road bridge on north edge of Elyria, 0.7 mile downstream from Elyria sewage disposal plant, and 5.2 miles downstream from gaging station at Elyria.

DRAINAGE AREA.--412 sq. mi.

PERIOD OF RECORD.--Chemical analyses: January 1966 to September 1968.
Water temperatures: January 1966 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 1,480 micromhos Jan. 23; minimum daily, 250 micromhos Feb. 1.
Water temperatures: Maximum, 28.0°C Aug. 21-24; minimum, freezing point on several days during December and January.

Period of record:

Specific conductance (January to September 1966, 1967-68): Maximum daily, 1,500 micromhos on many days during April and May, July to September 1966; minimum daily, 220 micromhos Feb. 11, 1966.
Dissolved oxygen (January to September 1968): Maximum daily, 15.0 mg/l or greater on several days during April to June 1966; minimum daily, 0.0 mg/l June 3, 5, 6, July 3, 4, 1966.
Water temperatures: Maximum, 29.0°C July 3, 1966, June 15, 1967; minimum, freezing point on many days during winter periods.

REMARKS.--Specific conductance values listed as 1,500 micromhos represent values of 1,500 micromhos or greater, due to instrument limitations. Dissolved oxygen concentrations listed as 15.0 mg/l represent concentrations of 15.0 mg/l or greater, due to instrument limitations. Interruptions in the record were due to malfunctions of the instrument. The quality of the water is affected by sewage disposal and industrial waste. Records of discharge are given for Black River at Elyria (drainage area 396 sq. mi.).

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR

DATE	TIME	DIC- CHARGE (CFS)	NICAR- BONATE (MG/3)	CAR- PONATE (CG)	SULFATE (SG)	CHLOR- IDE (CL)	FLUOR- IDE (F)
OCT.							
11...	1525	16	13C	0	224	112	1.4
22...	085C	5.5	82	0	245	9C	.9
NOV.							
05...	170C	26	64	0	191	8R	.8
29...	170C	19	134	0	192	132	1.2
DEC.							
19...	10CC	198	144	0	212	118	.4
24...	130C	324	112	0	158	62	.4
JAN.							
03...	1745	26	92	0	193	118	.7
22...	0945	50	12C	0	195	228	.5
FEB.							
01...	123C	4950	42	0	40	16	.1
29...	1245	41	114	0	23C	142	.4
MAR.							
01...	1715	40	128	0	240	116	.7
27...	1740	351C	62	0	63	2C	.2
APR.							
07...	0815	328	110	0	114	40	.3
21...	1350	68	126	2	214	62	.5
MAY							
08...	1645	74	144	0	150	72	.5
20...	1410	385C	94	0	57	14	.2
JUNE							
02...	1620	351	142	0	134	26	.3
19...	1600	40	114	0	168	82	.6
JULY							
10...	081C	16	54	0	15C	118	.4
24...	160C	265	114	0	10C	44	.4
AUG.							
11...	0900	12	20	0	197	132	.7
18...	092C	62	68	0	135	60	.4
SEPT.							
11...	1600	124	82	0	13C	5C	.5
29...	0930	9.8	110	0	23C	142	1.3
DATE	NITRATE (MG)	TOTAL PHOS- PHORUS (PO4)	SOLVED PHOS- PHORUS (P04)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	COM- POND- ING CAPAC- ITY (MICRO- MHOS)	PH
OCT.							
11...	55	--	682	224	117	117C	6.4
22...	32	--	64C	242	175	992	8.0
NOV.							
05...	34	--	52R	23C	177	856	7.4
29...	43	--	67C	312	202	115C	7.7
DEC.							
00...	28	--	624	344	246	103C	7.1
24...	26	--	47R	294	202	70R	7.2
JAN.							
08...	52	--	65R	284	209	966	8.1
22...	39	--	90R	366	268	140C	8.9
FEB.							
01...	17	--	176	132	68	252	7.4
29...	60	--	786	366	272	119C	6.6
MAR.							
01...	55	--	75P	37C	265	1110	6.9
27...	17	--	212	134	63	331	7.1
APR.							
07...	9.0	--	340	218	128	543	7.3
21...	12	--	538	31C	203	838	8.3
MAY							
08...	30	--	488	272	154	828	6.7
29...	18	--	202	136	67	323	6.9
JUNE							
02...	15	--	344	244	118	536	7.6
19...	46	--	652	296	202	877	8.5
JULY							
10...	52	5.2	550	298	184	934	7.0
24...	7.6	1.1	340	194	101	568	7.0
AUG.							
11...	74	6.6	666	264	247	107C	6.0
18...	24	1.6	424	218	146	667	8.0
SEPT.							
11...	25	2.3	340	19C	123	613	7.0
29...	67	10	712	28C	19C	124C	6.6

STREAMS TRIBUTARY TO LAKE ERIE

04200550 BLACK RIVER BELOW ELYRIA, OHIO--Continued

SPECIFIC CONDUCTANCE, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL						MAY						JUNE						
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	--	--	--	--	--	--	790	750	--	--	18	13	560	460	--	--	16	16	
2	--	--	--	--	--	--	810	760	--	--	18	12	550	530	--	--	18	16	
3	--	--	--	--	--	--	840	790	--	--	17	14	570	550	--	--	19	17	
4	--	--	--	--	--	--	840	770	--	--	17	14	700	670	--	--	20	18	
5	--	--	--	--	--	--	800	710	--	--	15	13	730	690	--	--	22	18	
6	560	540	--	--	10	8	770	720	--	--	17	12	780	700	--	--	23	20	
7	580	530	--	--	11	8	810	760	--	--	17	12	730	710	--	--	25	21	
8	680	580	--	--	13	10	850	800	--	--	18	14	750	710	--	--	25	22	
9	650	610	--	--	14	11	870	850	--	--	19	16	710	670	--	--	26	22	
10	660	620	--	--	13	11	900	850	--	--	20	16	690	660	--	--	26	23	
11	720	650	--	--	14	9	850	850	--	--	17	15	770	650	--	--	27	23	
12	720	680	--	--	16	13	690	500	--	--	15	13	810	740	--	--	26	23	
13	710	670	--	--	16	12	520	440	--	--	15	13	840	810	--	--	23	21	
14	750	690	--	--	17	13	480	450	--	--	15	14	880	840	--	--	24	19	
15	740	680	--	--	16	12	590	480	--	--	18	15	890	790	--	--	24	21	
16	790	740	--	--	17	12	580	440	--	--	18	17	830	710	--	--	23	21	
17	810	760	--	--	12	12	570	470	--	--	18	17	780	680	--	--	22	19	
18	830	780	--	--	14	13	590	550	--	--	17	17	810	680	--	--	22	18	
19	860	820	--	--	17	13	590	520	--	--	17	14	890	810	--	--	24	20	
20	850	830	--	--	15	14	600	530	--	--	17	14	920	860	--	--	23	20	
21	860	830	--	--	16	14	610	570	--	--	18	16	900	870	--	--	22	19	
22	830	770	--	--	17	13	610	590	--	--	20	18	930	880	--	--	24	21	
23	860	820	--	--	17	13	650	610	--	--	17	16	940	910	--	--	25	21	
24	860	780	--	--	15	12	670	630	--	--	17	16	860	860	--	--	24	23	
25	840	580	--	--	13	10	670	630	--	--	19	14	860	690	--	--	23	22	
26	60	610	--	--	11	9	700	600	--	--	18	17	960	720	--	--	23	22	
27	750	660	--	--	14	10	600	380	--	--	17	15	--	--	--	--	--	--	
28	730	640	--	--	16	11	390	310	--	--	14	14	--	--	--	--	--	--	
29	690	660	--	--	16	11	360	310	--	--	14	14	--	--	--	--	--	--	
30	770	710	--	--	16	13	460	330	--	--	16	14	--	--	--	--	--	--	
31	--	--	--	--	--	--	460	410	--	--	16	14	--	--	--	--	--	--	
DAY	JULY						AUGUST						SEPTEMBER						
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	--	--	--	--	--	--	880	770	3.0	.8	24	22	1100	1050	--	--	22	21	
2	--	--	--	--	--	--	1030	880	3.2	1.2	24	22	1110	1030	--	--	23	20	
3	--	--	--	--	--	--	1030	890	3.6	1.5	25	22	1240	1060	--	--	24	20	
4	--	--	--	--	--	--	920	880	4.2	1.3	25	23	1290	1240	--	--	25	21	
5	--	--	--	--	--	--	960	910	3.8	1.9	25	23	1240	810	--	--	24	22	
6	--	--	--	--	--	--	1000	960	3.8	1.6	27	24	1000	700	--	--	23	21	
7	--	--	--	--	--	--	970	880	--	--	27	25	920	740	--	--	22	19	
8	--	--	--	--	--	--	920	870	4.4	.6	27	24	840	780	--	--	22	19	
9	--	--	--	--	--	--	960	830	4.4	.3	27	24	840	780	--	--	22	20	
10	840	800	--	--	24	23	1070	960	4.4	.6	26	23	840	700	--	--	22	21	
11	860	840	--	--	26	22	1100	1070	6.6	2.1	24	21	820	420	--	--	21	19	
12	860	840	--	--	26	22	1130	1070	6.6	3.6	24	20	760	700	--	--	21	18	
13	880	840	--	--	26	22	1130	1060	6.8	3.4	24	21	840	680	--	--	22	18	
14	890	840	--	--	27	23	1060	990	5.6	1.9	26	22	800	720	--	--	22	19	
15	940	890	--	--	26	24	1040	950	3.2	1.2	26	22	800	750	--	--	22	19	
16	940	680	3.7	2.7	25	23	1060	740	2.6	1.0	26	23	860	740	--	--	23	19	
17	900	670	4.6	2.9	27	24	1050	620	4.4	2.0	25	23	940	780	--	--	23	21	
18	880	740	4.5	3.0	27	24	710	640	4.0	3.5	25	22	970	820	--	--	23	21	
19	840	670	5.5	1.9	27	23	750	700	7.1	2.6	26	23	1010	880	--	--	23	21	
20	880	840	4.3	1.7	27	23	750	670	6.5	2.0	27	24	1040	920	--	--	23	21	
21	870	830	4.0	2.1	27	22	830	740	4.9	1.0	28	25	1060	960	--	--	24	21	
22	850	510	3.0	1.7	26	23	850	810	3.5	1.6	28	26	1040	960	--	--	23	22	
23	730	660	3.1	2.3	25	22	900	840	3.1	1.6	28	26	1100	880	--	--	24	22	
24	630	460	3.2	2.0	22	22	930	870	3.3	1.5	28	27	1160	920	--	--	24	22	
25	580	500	2.2	1.5	24	21	960	910	3.1	1.9	27	24	1110	980	3.2	4.3	23	21	
26	660	550	1.8	1.2	25	21	1120	960	--	--	24	21	1120	1020	5.1	3.2	21	18	
27	700	630	1.7	1.2	24	22	1130	980	--	--	23	20	1170	1060	4.7	3.1	19	17	
28	690	640	1.6	1.2	25	22	1040	990	--	--	23	19	1320	1170	4.5	3.2	19	17	
29	770	690	1.7	1.2	24	21	1140	1020	--	--	23	19	1260	1200	3.8	3.4	18	16	
30	880	750	2.0	1.3	23	21	1130	1090	--	--	23	19	1310	1150	--	--	19	15	
31	880	780	2.5	.8	24	22	1120	1100	--	--	24	19	--	--	--	--	--	--	

STREAMS TRIBUTARY TO LAKE ERIE

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04208000 CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.--Lat 41°23'44", long 81°37'45", in T.6 N., R.12 W., Cuyahoga County, at gaging station on right bank 140 ft downstream from highway bridge on Old Rockside Road, 1 mile northeast of Independence, and 3 miles downstream from Tinkers Creek.

DRAINAGE AREA.--707 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1948 to September 1949, July 1965 to September 1968.

Water temperatures: October 1948 to September 1949, October 1952 to September 1968.

Sediment records: October 1950 to September 1968.

EXTREMES.--1967-68:

Sediment concentrations: Maximum daily, 1,680 mg/l July 17; minimum daily, 8 mg/l Aug. 26.
Sediment loads: Maximum daily, 21,000 tons Jan. 30; minimum daily, 3.9 tons Oct. 16.

Period of record:

Water temperatures (1948-49, 1952-67): Maximum, 31.0°C Aug. 18, 1949; minimum, freezing point on many days during winter periods.
Sediment concentrations (1950-68): Maximum daily, 4,800 mg/l Aug. 21, 1960; minimum daily 1 mg/l Sept. 4, 10, 1955.
Sediment loads (1950-68): Maximum daily, 51,400 tons Mar. 5, 1964; minimum daily, 0.25 ton Sept. 4, 1955.

REMARKS.--Continuous recorder installed in gage house. In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on the maximum specific conductance and the minimum specific conductance of the samples collected for the period April to September. Specific conductance values listed as 1,500 microhos represent values of 1,500 microhos or greater, due to instrument limitations. Interruptions in the record were due to malfunctions of the instrument. Diurnal fluctuations caused by power-plants above station. Water diverted into Ohio Canal at Brecksville, 6 miles upstream from station bypasses station. Loads computed by subdividing day on June 12, 16, 24, July 22, 23, Aug. 1, 17, 18, Sept. 6, 7, 22-24.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, APRIL TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	CARBONATE (MG/L)	CARBONATE (MG/L)	SULFATE (MG/L)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	DIS-SOLVED SOLIDS (DSS) (MG/L)	HARDNESS (CA-MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROHMOS)	PH
APR.													
03...	1145	858	106	0	171	82	.3	14	366	194	107	668	8.0
16...	1310	640	124	0	170	100	.4	15	442	218	117	744	8.2
JUNE													
18...	1545	460	149	0	118	132	.4	16	562	248	126	919	7.7
27...	0945	750	134	0	98	74	.4	8.2	402	215	105	667	6.7
JULY													
16...	1200	150	174	5	171	200	.5	16	640	247	136	1170	8.4
18...	0945	400	102	0	68	33	.4	3.3	262	154	70	437	7.6
AUG.													
08...	--	300	142	2	104	95	.6	6.3	444	222	102	755	8.3
29...	1245	187	160	0	126	240	.7	13	754	256	145	1320	7.0
SEP.													
19...	1350	166	169	3	141	340	.7	22	940	315	171	1640	8.3
24...	0904	580	120	0	96	71	.5	4.4	372	203	105	620	8.0

SPECIFIC CONDUCTANCE, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER					NOVEMBER					DECEMBER				
	SPECIFIC CONDUCTANCE (MICROHMOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROHMOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROHMOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)
	MAX	MIN	MAX	MIN	MAX MIN	MAX	MIN	MAX	MIN	MAX MIN	MAX	MIN	MAX	MIN	MAX MIN
1	--	--	--	--	-- --	1500	1130	7.1	5.8	13 11	1080	820	10.6	10.0	5 4
2	--	--	--	--	-- --	1500	930	6.8	5.9	13 12	1500	1030	10.4	9.8	5 4
3	--	--	--	--	-- --	990	840	7.9	6.6	12 11	1130	580	11.4	9.9	5 4
4	--	--	--	--	-- --	1120	890	7.7	6.9	11 10	850	580	11.8	11.3	4 3
5	--	--	--	--	-- --	1030	860	8.3	6.8	10 8	910	700	11.5	10.9	5 3
6	--	--	--	--	-- --	1150	940	8.4	8.0	8 7	1010	880	10.9	10.2	6 5
7	--	--	--	--	-- --	1220	1120	8.6	8.2	7 7	1500	860	10.2	9.3	8 6
8	--	--	--	--	-- --	1170	1020	8.2	7.8	8 7	890	770	9.7	9.4	7 7
9	--	--	--	--	-- --	1310	1100	8.0	7.6	9 8	780	740	9.6	9.5	7 7
10	--	--	--	--	-- --	1180	1120	7.9	7.5	9 8	850	770	9.7	9.5	7 7
11	1100	1040	5.0	4.4	-- --	1315	1120	7.5	7.0	10 9	920	740	9.7	8.0	7 7
12	1180	1040	5.2	5.0	-- --	1280	990	7.5	6.7	10 10	850	720	9.6	8.0	8 6
13	1260	1100	5.3	5.0	-- --	1040	820	8.4	7.4	10 7	870	740	8.2	8.0	8 8
14	1250	1150	5.3	4.7	-- --	1140	980	9.1	7.9	8 6	910	790	8.4	8.2	8 8
15	1300	1180	5.1	4.4	-- --	1300	1140	9.2	8.2	6 5	800	740	9.3	8.4	8 7
16	1210	1120	4.6	4.2	-- --	1500	1310	9.6	9.0	6 5	830	720	9.3	8.2	7 7
17	1190	1090	6.4	3.8	-- --	1500	1370	9.9	9.1	6 6	880	760	9.1	8.2	8 7
18	1130	950	6.9	5.8	-- --	1440	860	9.8	8.3	7 6	1200	800	9.1	7.9	10 8
19	1110	780	8.3	3.0	14 12	880	810	10.0	9.0	6 5	850	670	9.4	9.1	10 9
20	850	750	7.6	6.6	12 11	860	800	10.6	9.2	6 5	750	660	9.4	9.0	9 9
21	1030	850	6.8	6.4	12 11	940	830	10.0	9.0	6 5	750	700	9.2	8.1	10 8
22	1500	1030	6.8	6.3	12 11	890	810	9.3	8.5	8 6	980	620	10.3	8.2	12 10
23	1500	1250	6.7	6.4	12 11	870	700	10.9	9.7	7 6	700	570	10.6	9.6	10 8
24	1500	1220	6.6	5.9	13 11	730	680	11.6	10.6	6 5	1000	700	11.1	10.6	8 7
25	1500	1070	6.2	5.4	13 12	800	700	11.3	10.9	6 5	1130	820	12.3	11.1	7 7
26	1140	1040	6.7	5.7	12 11	770	680	10.9	10.6	6 5	1110	720	13.8	12.3	7 6
27	1040	980	6.7	6.3	11 10	800	680	11.3	10.7	5 4	830	610	14.2	13.3	6 4
28	1080	1020	7.0	6.4	10 9	1120	710	11.3	10.4	4 4	1040	780	13.3	12.9	6 5
29	1080	1000	7.5	6.9	10 9	920	720	11.2	10.8	4 3	1200	930	--	--	7 6
30	1500	990	7.1	6.6	10 9	1050	800	10.8	10.2	5 4	1270	1040	--	--	7 6
31	1490	1400	6.6	6.0	11 10	--	--	--	--	-- --	1160	960	--	--	7 6

04208000 CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

SPECIFIC CONDUCTANCE, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	JULY					AUGUST					SEPTEMBER				
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)
	MAX	MIN	MAX	MIN	MAX MIN	MAX	MIN	MAX	MIN	MAX MIN	MAX	MIN	MAX	MIN	MAX MIN
1	--	--	--	--	-- --	1120	470	4.6	3.2	24 22	1350	1000	3.9	3.6	22 20
2	--	--	--	--	-- --	610	380	5.4	4.5	24 22	1290	930	3.9	3.4	21 20
3	--	--	--	--	-- --	890	560	5.0	4.4	24 23	1320	810	4.5	3.3	21 19
4	--	--	--	--	-- --	790	600	4.4	3.9	24 23	1290	460	4.5	3.6	21 19
5	--	--	--	--	-- --	990	470	4.4	3.5	25 23	1420	580	5.5	3.9	22 20
6	--	--	--	--	-- --	980	530	4.3	3.8	25 24	1470	740	5.7	4.6	22 21
7	--	--	--	--	-- --	980	550	4.6	4.2	25 23	1080	430	5.9	4.4	22 21
8	--	--	--	--	-- --	870	490	4.2	3.9	26 24	770	490	7.1	5.9	21 19
9	--	--	--	--	-- --	1280	520	4.1	4.0	26 24	1040	670	6.7	6.1	21 19
10	--	--	--	--	-- --	1200	500	4.0	3.7	25 23	1340	480	6.6	5.8	21 19
11	--	--	--	--	-- --	990	610	4.0	3.7	23 21	1390	780	6.2	5.3	21 20
12	--	--	--	--	-- --	1270	520	5.1	3.9	23 21	1470	690	6.2	5.0	21 19
13	--	--	--	--	-- --	1100	750	5.0	4.3	23 21	1180	660	7.0	4.8	20 18
14	--	--	--	--	-- --	1160	450	4.7	3.7	24 22	1430	750	6.1	5.4	20 18
15	--	--	--	--	-- --	1190	770	3.7	2.5	25 22	1320	870	5.8	5.0	21 18
16	--	--	--	--	-- --	1440	550	4.2	3.0	25 23	1460	1090	5.5	4.9	22 19
17	--	--	--	--	-- --	820	480	4.7	3.6	25 23	1650	670	5.5	4.5	22 20
18	--	--	--	--	-- --	890	570	5.8	3.8	25 23	1330	730	5.5	4.5	22 20
19	--	--	--	--	-- --	1100	560	6.0	4.4	25 23	1930	700	5.4	4.1	22 20
20	--	--	--	--	-- --	1320	770	4.8	3.7	26 25	1480	600	4.6	3.8	22 20
21	--	--	--	--	-- --	1270	770	4.0	3.1	27 25	1730	770	3.9	3.5	22 20
22	--	--	--	--	-- --	1400	610	3.7	2.6	27 26	1380	990	4.7	3.4	22 21
23	920	390	4.6	4.1	25 23	1480	750	3.4	2.7	28 26	1130	520	5.2	3.2	22 21
24	800	400	5.2	4.6	24 23	1260	820	3.3	2.7	28 27	730	490	5.5	4.8	22 21
25	770	540	4.8	4.2	25 23	1110	730	3.4	3.0	27 26	1140	570	5.1	4.6	22 21
26	760	570	4.3	4.2	25 23	1140	530	3.6	2.9	25 23	1160	750	5.2	4.5	21 19
27	900	500	4.2	3.8	24 23	1080	760	3.7	3.1	23 21	1250	550	5.1	4.7	19 18
28	890	580	4.6	4.0	25 23	1190	560	3.7	3.0	22 20	1370	870	5.0	4.6	19 17
29	1040	690	4.9	4.2	24 23	1460	720	3.9	3.3	22 19	1390	920	5.3	4.8	18 17
30	1020	610	5.2	4.4	23 21	1410	740	4.3	3.7	22 19	1360	680	5.3	4.8	18 17
31	1090	670	5.0	4.2	23 22	1390	650	4.4	3.6	22 20	--	--	--	--	--

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	213	22	13	163	16	7.0	410	32	35
2	185	18	9.0	76.4	44	91	356	30	3F
3	197	20	1C	470	36	45	142C	99	39C
4	172	17	7.9	460	36	45	113C	69	21C
5	162	16	7.0	354	31	30	825	45	10C
6	150	15	6.1	298	31	25	72C	41	8C
7	138	13	4.8	283	33	25	754	44	9C
8	174	17	8.0	262	27	19	732	43	8C
9	342	32	30	241	25	16	650	40	7C
10	202	22	12	224	23	14	605	40	6C
11	173	17	7.9	217	24	14	792	44	9C
12	160	16	6.9	388	29	30	830	45	100
13	150	15	6.1	310	30	25	748	42	85
14	163	16	7.0	294	31	25	620	39	6C
15	148	13	5.2	326	28	25	545	37	55
16	132	11	3.9	354	31	30	48C	35	45
17	168	15	6.8	470	35	34	420	35	4C
18	420	35	40	1190	75	240	660	42	75
19	692	41	75	1130	19	210	726	41	8C
20	392	33	35	732	43	85	595	38	6C
21	248	27	18	595	38	60	510	36	50
22	202	22	12	657	40	70	1170	73	231
23	190	19	9.7	902	53	132	886	50	12C
24	196	21	11	803	46	10C	682	41	75
25	211	23	13	764	44	90	695	40	65
26	202	22	12	692	41	75	869	51	12C
27	193	19	9.9	620	39	65	605	40	65
28	193	19	9.9	550	37	55	520	36	50
29	155	14	5.9	500	37	50	465	36	45
30	133	11	4.0	450	37	45	402	87	35
31	148	13	5.2	--	--	--	370	30	3C
TOTAL	6984	--	412.2	15436	--	1785.0	21102	--	2731

STREAMS TRIBUTARY TO LAKE ERIE

04208000 CUYABOGA RIVER AT INDEPENDENCE, OHIO--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968									
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	310	30	25	5470	670	9900	238	25	16
2	290	32	25	5910	752	12000	234	24	15
3	286	32	25	4990	594	8000	214	22	13
4	266	28	20	3960	449	4800	217	24	14
5	227	24	15	3130	331	2800	294	31	25
6	252	26	18	2570	259	1800	470	21	45
7	214	22	13	2100	194	1100	465	36	45
8	205	22	12	1670	138	622	510	36	50
9	322	29	25	1380	97	361	1060	59	169
10	310	30	25	1070	59	170	1290	74	240
11	202	22	12	781	45	95	1130	69	210
12	190	19	10	704	47	80	1060	59	170
13	187	20	10	660	42	75	1130	69	210
14	208	21	12	595	37	60	1020	58	160
15	199	20	11	570	36	55	1140	68	209
16	224	23	14	520	36	50	1960	170	900
17	208	21	12	456	37	45	2120	175	1000
18	208	21	12	362	31	30	1670	111	500
19	259	27	19	334	33	30	1430	101	390
20	269	28	20	338	33	30	1370	92	360
21	306	30	25	306	30	25	1400	98	370
22	326	28	25	290	32	25	1490	112	451
23	379	29	30	280	26	20	2000	167	902
24	346	32	30	266	28	20	1650	112	500
25	314	29	25	241	25	16	1890	157	800
26	302	31	25	224	23	14	2310	224	1400
27	290	32	25	241	25	16	2640	266	1900
28	1670	138	622	245	26	17	2030	201	1100
29	4550	530	6510	252	26	18	1560	119	500
30	7830	993	21000	--	--	--	1350	93	340
31	6200	777	13000	--	--	--	1190	90	290
TOTAL	27349	--	41652	39915	--	42274	38442	--	3273
DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	1270	82	280	560	36	54	1400	98	370
2	1010	59	160	505	37	50	1340	91	329
3	864	51	120	480	35	45	1130	69	211
4	1400	98	570	650	40	70	858	47	109
5	1190	75	240	704	42	80	615	42	70
6	908	53	130	565	36	55	640	47	81
7	809	46	100	433	34	40	535	38	55
8	787	45	96	350	32	30	424	27	31
9	732	43	85	415	36	40	306	23	19
10	699	42	80	525	35	50	310	21	18
11	585	38	60	595	37	60	318	20	17
12	505	37	50	2710	27	2000	470	69	97
13	330	34	30	1690	131	598	314	24	20
14	330	34	30	1340	91	330	266	20	14
15	902	53	130	1750	138	650	252	30	20
16	693	43	80	3800	429	4400	764	384	1050
17	485	34	45	2370	234	1500	605	76	124
18	330	34	30	1650	123	548	520	63	88
19	334	33	30	1440	103	400	384	30	31
20	330	34	30	1470	111	441	306	22	18
21	433	34	40	1310	85	300	259	19	14
22	346	32	30	1230	78	260	227	16	9.8
23	366	30	30	1090	61	180	202	15	8.2
24	1270	82	280	1030	58	160	184	25	14
25	1030	58	160	891	50	120	666	341	613
26	880	51	120	880	51	120	1070	390	1130
27	875	51	120	3730	437	4400	1160	240	752
28	754	44	90	4190	477	5400	776	91	151
29	605	39	64	2500	252	1700	575	50	78
30	605	39	64	1930	163	850	475	33	42
31	--	--	--	1610	127	552	--	--	--
TOTAL	21657	--	3174	44393	--	25483	17361	--	5624.0

04208000 CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	420	51	58	743	198	569	123	13	4.3
2	406	64	70	495	68	91	184	36	18
3	350	37	35	338	32	29	11.0	24	9.1
4	258	23	16	262	27	19	150	66	28
5	224	21	13	234	33	21	199	60	32
6	241	19	12	220	18	11	693	432	101.0
7	208	18	10	520	819	1150	302	71	65
8	217	20	12	354	305	292	202	28	15
9	193	23	12	384	60	62	155	23	9.6
10	178	21	10	318	20	17	178	154	74
11	172	20	9.3	230	20	12	148	148	59
12	152	20	8.2	274	21	15	255	127	87
13	142	21	8.1	248	130	87	220	146	27
14	140	15	5.7	241	72	47	166	28	13
15	123	16	6.0	202	32	17	155	13	5.4
16	266	109	78	318	306	263	145	18	7.0
18	4540	1680	20600	842	650	1570	355	23	9.6
19	1760	595	2760	346	74	78	145	24	9.4
19	710	354	679	245	73	18	155	25	10
20	585	286	452	227	20	12	184	30	15
21	370	96	96	244	8	4.6	352	19	7.8
22	370	51	54	202	18	9.8	169	19	30
23	550	333	813	234	17	11	1200	1150	444.0
24	891	540	1300	273	17	13	565	329	636
25	605	117	191	259	18	13	342	60	55
26	370	49	49	227	13	8.0	252	52	35
27	302	26	23	234	16	11	244	32	18
28	283	22	17	208	17	9.5	190	32	16
29	255	23	16	184	16	8.9	190	27	14
30	241	22	14	155	17	7.1	148	19	7.6
31	220	20	12	135	15	5.5	--	--	--
TOTAL	15742	--	27459.3	9316	--	4511.4	7476	--	6766.8
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)									264773
TOTAL LOAD FOR YEAR (TONS)									175445.7

04208505 CUYAHOGA RIVER AT DUPONT INTAKE IN CLEVELAND, OHIO

LOCATION.--Lat 41°28'39", long 81°40'13", Cuyahoga County, at Dupont Products Division water intake on east side of turning basin at station 722, 5.1 miles upstream from mouth, in Cleveland.

DRAINAGE AREA.--794 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1964 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 2,110 micromhos Jan. 20; minimum daily, 420 micromhos Feb. 1, 2.

Period of record:

Specific conductance: Maximum daily 2,110 micromhos Jan. 20, 1968; minimum daily, 380 micromhos Feb. 14, 1966.

REMARKS.--The conductance recorder is located in brick building at edge of turning basin. In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum specific conductance and minimum specific conductance of the samples collected each month. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	BICARBONATE (MG/L)	CARBONATE (MG/L)	SULFATE (MG/L)	CHLORIDE (MG/L)	FLUORIDE (MG/L)	NITRATE (MG/L)	DISSOLVED SOLIDS (MG/L)	HARDNESS (MG/L)	NON-CARBONATE HARDNESS (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
OCT.												
10...	1915	28		224	144	1.8	37	677	297	267	178	5.7
24...	1:50			259	245	1.4	40	868	312	212	144	4.5
NOV.												
11...	9:00	34		204	200	2.1	18	808	338	311	1350	5.7
28...	11:30	28		198	118	1.5	35	572	266	243	963	6.7
DEC.												
06...	1:41	38		21	144	1.9	38	660	284	253	1730	6.0
12...	13:30	48		188	110	1.8	34	592	278	239	896	7.8
JAN.												
22...	12:45	70		16	380	1.1	35	1780	208	241	1760	7.2
31...	11:10	74		93	68	1.7	2.8	348	174	113	544	7.7
FEB.												
18...	11:45	42		27	61	1.7	14	336	160	126	494	7.6
28...	11:50	2		89	212	2.2	7	856	324	322	1362	4.7
MAR.												
15...	1:10	2		246	238	2.2	4	802	297	295	1430	5.6
28...	14:30	61		114	92	1.7	12	388	186	137	635	6.7
APR.												
13...	1:50	32		189	95	1.1	29	506	248	222	850	6.1
23...	19:15	3		229	160	1.5	46	672	292	280	1080	6.7
MAY												
28...	13:30	86		85	42	1.6	6.8	271	162	97	473	6.5
JUNE												
14...	11:10	32		177	78	1.8	30	468	234	218	780	5.9
12...	1:45	67		0	129	2.7	30	636	297	238	1140	6.2
JULY												
15...	14:50	42		180	150	1.7	52	664	274	239	1140	7.3
18...	12:45	78		100	53	1.6	11	326	172	118	535	6.7
AUG.												
17...	12:30	96		100	96	1.6	28	524	234	180	843	6.2
14...	12:15	74		228	152	2.6	48	714	304	284	1200	6.8
SEPT.												
18...	19:45	46		222	190	2.5	42	780	298	227	1310	6.3
24...	10:10	91		137	79	1.1	16	446	222	144	748	6.4

04208505 CUYABOGA RIVER AT DUPONT INTAKE IN CLEVELAND, OHIO--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
1.....	1180	1110	1360	1150	1360	1060	1220	1100	590	420	1710	1500
2.....	1330	1150	1310	820	1360	1290	1150	1090	500	420	1760	1540
3.....	1410	1210	1120	950	1350	990	1180	1120	460	440	1690	1560
4.....	1640	1250	1060	970	960	840	1320	1140	470	440	1570	1520
5.....	1280	1120	1090	1010	1200	800	1420	1300	470	450	1560	1420
6.....	1160	1120	1070	940	1120	920	1380	1340	--	--	1460	1380
7.....	1170	1110	1220	970	1110	1070	1340	1220	--	--	1430	1310
8.....	1270	1170	1270	1170	1170	700	1320	1210	580	580	1370	1190
9.....	1120	1090	1380	1200	1060	950	1420	1300	720	630	1180	980
10.....	1140	1050	1340	1180	1050	870	1460	1400	810	700	980	800
11.....	1190	1120	1280	1150	910	850	1470	1440	900	760	840	720
12.....	1190	1150	1170	1020	930	870	1470	1430	1020	870	870	740
13.....	1230	1190	1040	990	960	920	1460	1400	1100	990	980	800
14.....	1450	1250	1300	1000	1020	900	1410	1310	1060	980	1250	960
15.....	1350	1150	1350	1150	1260	980	1540	1330	1180	980	1420	1140
16.....	1240	1170	1450	1160	1210	940	1600	1480	1160	1020	1250	790
17.....	1450	1200	1650	1450	980	910	1660	1510	1140	1220	800	670
18.....	1330	1000	1590	1150	970	890	1700	1620	1180	1100	730	650
19.....	1090	1030	1190	920	1000	880	2040	1660	1100	980	800	660
20.....	1130	1020	960	890	920	820	2110	1990	1100	1030	860	730
21.....	1110	1060	1000	930	950	850	2090	1840	1250	1100	810	730
22.....	1050	950	1050	990	930	710	1840	1710	1360	1240	820	730
23.....	1160	1030	1070	870	780	700	1710	1610	1610	1360	1030	810
24.....	1510	1150	950	880	760	590	1760	1640	1600	1570	1070	930
25.....	1490	1390	890	850	950	750	1790	1740	1680	1440	1120	900
26.....	1470	1370	920	850	1230	920	1860	1760	1530	1380	940	690
27.....	1390	1280	930	850	1170	800	1840	1430	1550	1280	690	670
28.....	1310	1170	990	970	1050	970	1690	1620	1420	1340	760	600
29.....	1140	1030	1150	940	1330	960	820	550	1530	1420	770	660
30.....	1040	980	1120	1020	1340	1260	610	640	--	--	850	680
31.....	1160	1020	--	--	1340	1180	620	660	--	--	880	690
AVERAGE	1260	1130	1170	1010	1060	912	1490	1340	1080	960	1100	936
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
1.....	830	710	1010	900	730	620	1020	910	1200	1040	1280	1230
2.....	890	720	950	870	730	640	1130	910	1100	960	1230	970
3.....	930	650	1130	900	720	630	1040	920	900	840	1090	960
4.....	950	720	1210	830	950	680	1070	930	980	900	1160	1080
5.....	950	680	960	830	990	790	1060	980	1120	920	1500	1090
6.....	930	830	1030	870	930	850	1200	1010	1170	960	1190	920
7.....	970	830	1050	910	1340	900	1100	990	1120	750	1020	880
8.....	990	810	1160	1040	1120	960	1040	950	1080	970	920	860
9.....	930	820	1250	1090	1210	990	1100	970	1300	900	950	880
10.....	970	830	1260	1140	1590	970	1200	1000	1250	980	1090	940
11.....	1090	890	1270	950	1170	1040	1210	1150	1330	1160	1160	1060
12.....	1030	840	1030	910	1390	980	1410	1200	1160	1060	1120	900
13.....	920	850	750	950	1080	980	1370	1210	1200	1060	1220	1020
14.....	930	840	820	670	1130	1020	1630	1270	1260	1160	1300	1180
15.....	940	860	880	660	1340	1100	1270	1130	1200	1120	1300	1220
16.....	890	830	620	470	1230	940	1210	780	1140	800	1250	1150
17.....	980	830	700	500	950	860	820	640	870	670	1280	1170
18.....	1080	930	750	520	900	790	650	480	980	690	1340	1280
19.....	1130	1050	830	660	1130	870	830	530	890	760	1400	1220
20.....	1200	1090	670	530	1200	1100	970	810	1000	820	1400	1220
21.....	1270	1070	880	660	1260	1100	970	950	1120	980	1420	1340
22.....	1250	1070	960	770	1260	1120	990	930	1250	1090	1360	1200
23.....	1130	1000	880	830	1280	1170	930	770	1190	1120	1290	790
24.....	1070	720	950	860	1280	1160	930	680	1250	1120	950	730
25.....	830	710	910	870	1210	900	820	480	1180	1140	970	870
26.....	830	730	960	850	960	680	950	820	1140	1080	1110	960
27.....	1050	760	850	490	870	640	1140	900	1170	1080	1160	1070
28.....	830	730	600	450	960	740	990	950	1180	1120	1210	1150
29.....	850	750	670	540	1370	850	1220	980	1180	1120	1290	1210
30.....	920	820	760	590	1090	900	1140	1060	1180	1180	1350	1210
31.....	--	--	740	610	--	--	1280	1170	1280	1260	--	--
AVERAGE	983	829	915	731	1080	899	1080	919	1130	988	1200	1060

04208506 CUYAHOGA RIVER AT WEST THIRD STREET BRIDGE, IN CLEVELAND, OHIO

LOCATION.--Lat 41°29'17", long 81°41'07", Cuyahoga County, at bridge on West Third Street in Cleveland, 3 miles upstream from mouth, and 1.2 miles downstream from turning basin. Monitor located in small building on left bank just above bridge.

DRAINAGE AREA.--798 sq mi.

PERIOD OF RECORD.--Chemical analyses: November 1966 to September 1968, Water temperatures: November 1966 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 2,030 micromhos Jan. 21; minimum daily, 420 micromhos Feb. 2, 6.
 Dissolved oxygen: Maximum daily, 10.8 mg/l Feb. 18; minimum daily, 0.0 mg/l on many days during October, November, April to September.
 Water temperatures: Maximum, 33.0°C July 15; minimum, 2.0°C Jan. 30, 31, Feb. 4.

Period of record:

Specific conductance (1967-68): Maximum daily, 2,030 micromhos Jan. 21, 1968; minimum daily, 420 micromhos Feb. 2, 6, 1968.
 Dissolved oxygen (1967-68): Maximum daily, 10.8 mg/l Feb. 18, 1968; minimum daily, 0.0 mg/l on many days during October and November 1967, April to September 1968.
 Water temperatures: Maximum, 33.0°C July 24, 1967; minimum, 2.0°C Feb. 3, 1967, Jan. 30, 31, Feb. 4, 1968.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum specific conductance and minimum specific conductance of the samples collected each month. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
OCT.							
19...	0700	20	0	226	111	1.1	32
26...	0700	3	0	323	235	3.1	35
NOV.							
17...	0900	52	0	244	260	2.9	28
24...	0830	64	0	162	106	.6	20
DEC.							
07...	0930	43	0	208	162	1.7	37
19...	0830	28	0	177	116	1.2	40
JAN.							
22...	0930	54	0	177	440	1.4	46
31...	0930	58	0	86	62	.5	11
FEB.							
05...	0900	52	0	78	56	.2	12
29...	0800	0	0	275	274	2.3	41
MAR.							
01...	0830	10	0	275	280	2.8	38
28...	1220	56	0	117	78	.8	16
APR.							
02...	1000	50	0	152	95	.7	28
19...	0900	68	0	172	180	2.3	56
MAY							
10...	0730	40	0	239	126	2.3	47
15...	0730	84	0	99	50	.7	7.8
JUNE							
03...	0730	100	0	109	72	.6	18
24...	0730	19	0	246	152	3.4	60
JULY							
12...	0945	4	0	263	168	3.3	46
18...	1000	88	0	86	48	.5	12
AUG.							
15...	0900	122	0	223	156	2.3	5.6
20...	0900	95	0	113	102	1.0	18
SEPT.							
15...	0900	146	0	214	178	2.5	7.8

DATE	TOTAL PHOS- PHORUS (PO4)	DIS- SOLVED SOL105 (RESI- DUE AT 180 C)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH
OCT.						
19...	--	602	284	268	958	--
26...	--	912	366	364	1540	--
NOV.						
17...	--	926	330	287	1510	6.7
24...	--	574	249	106	860	7.1
DEC.						
07...	--	688	290	255	1100	6.8
19...	--	578	248	225	900	7.4
JAN.						
22...	--	1130	300	256	1850	7.9
31...	--	322	156	108	494	7.9
FEB.						
05...	--	298	144	101	460	6.8
29...	--	930	334	334	1540	--
MAR.						
01...	--	920	326	318	1630	--
28...	--	394	270	154	633	6.4
APR.						
02...	--	474	226	185	777	7.7
19...	--	658	238	183	1190	--
MAY						
10...	--	680	310	277	1130	--
15...	--	308	172	103	527	7.2
JUNE						
03...	--	410	324	242	687	--
24...	--	766	210	190	1260	6.5
JULY						
12...	.09	740	316	313	1200	--
18...	.33	326	170	98	512	6.8
AUG.						
15...	.14	674	320	220	1220	--
20...	.42	442	210	132	813	8.1
SEPT.						
16...	.12	708	312	192	1290	--

04208506 CUYAHOGA RIVER AT WEST THIRD STREET BRIDGE, IN CLEVELAND, OHIO—Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	FEBRUARY								MARCH							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)			SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN		MAX	MIN	MAX	MIN		MAX	MIN		MAX	MIN	MAX	MIN	MAX	MIN
1	500	450	7.8	7.0	9.2	8.7	4	3	--	--	6.5	6.4	4.4	2.9	14	13
2	470	420	7.5	7.2	8.9	8.3	5	4	--	--	6.6	6.5	3.6	3.0	14	13
3	460	430	7.5	7.2	9.2	8.5	4	3	--	--	6.5	6.4	4.0	3.0	13	13
4	470	430	7.8	7.1	9.6	9.0	3	2	--	--	6.9	6.5	4.8	3.3	13	13
5	460	430	7.8	6.9	9.5	9.1	3	3	1480	1390	7.0	6.7	4.4	3.2	14	13
6	500	420	7.2	6.9	9.4	9.1	4	3	1440	1400	6.7	6.6	4.3	3.5	14	13
7	570	470	7.2	6.9	9.4	8.7	5	4	1450	1400	6.8	6.7	4.7	4.1	13	12
8	590	560	7.1	6.6	9.3	8.6	5	5	1420	1220	6.8	6.6	5.8	4.7	13	12
9	660	570	7.2	6.6	9.1	8.4	6	5	1220	1080	6.9	6.7	6.3	5.2	12	10
10	750	560	7.4	6.8	9.0	8.2	6	5	1080	900	7.3	6.9	7.3	6.3	10	9
11	800	730	7.6	7.1	8.9	8.4	6	5	900	820	7.4	7.1	7.4	6.8	10	9
12	870	770	7.6	7.2	9.3	8.1	6	5	880	820	7.2	6.9	7.0	6.3	11	9
13	920	870	7.3	6.8	8.6	7.7	7	6	960	880	7.2	7.0	7.5	6.6	10	8
14	1010	920	7.0	6.7	8.0	7.0	8	7	1230	960	7.1	6.9	7.9	7.4	9	8
15	1160	1010	7.0	6.7	7.3	6.6	9	8	1400	1280	6.9	6.3	8.4	7.3	9	8
16	1220	1140	7.1	6.8	6.8	5.6	10	9	1310	890	7.2	6.0	8.3	7.6	9	7
17	1180	1140	7.0	6.8	5.7	5.1	10	10	890	730	7.2	6.3	8.8	8.0	8	7
18	1390	1340	6.9	6.7	10.8	4.8	10	10	740	630	7.2	6.8	8.6	7.9	9	8
19	1200	1090	7.3	6.6	8.6	4.5	11	10	810	680	7.2	6.8	8.3	7.6	10	8
20	1150	1080	7.3	6.9	6.6	6.1	10	10	800	780	7.0	6.6	8.0	7.0	11	10
21	1270	1150	6.9	6.7	6.4	5.0	11	10	790	760	--	--	8.0	7.2	11	10
22	1330	1270	6.8	6.6	5.1	4.7	11	11	800	760	--	--	8.8	7.9	10	9
23	1540	1330	6.7	6.3	5.7	4.7	12	10	840	760	--	--	9.4	8.5	9	7
24	1630	1540	6.6	6.4	5.4	4.2	12	11	850	710	--	--	9.7	8.9	8	7
25	1650	1590	6.5	6.3	4.7	4.0	13	12	810	680	--	--	9.6	9.1	8	8
26	1600	1390	6.9	6.5	4.5	3.5	13	12	750	660	--	--	9.4	8.7	9	8
27	--	--	7.0	6.7	6.5	3.0	13	12	670	620	--	--	9.3	8.7	10	9
28	--	--	6.8	6.6	5.5	4.6	13	13	670	620	--	--	9.3	8.0	12	10
29	--	--	6.6	6.3	5.3	4.3	14	13	680	660	--	--	8.2	6.6	14	12
30	--	--	--	--	--	--	--	--	740	670	--	--	6.7	5.4	14	13
31	--	--	--	--	--	--	--	--	760	710	--	--	5.9	5.2	14	13

DAY	APRIL								MAY							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)			SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN		MAX	MIN	MAX	MIN		MAX	MIN		MAX	MIN	MAX	MIN	MAX	MIN
1	800	740	--	--	5.8	4.7	15	13	1040	930	6.7	6.5	0.3	0.0	21	20
2	790	750	--	--	5.4	5.0	15	13	1030	990	6.7	6.5	.1	.0	21	21
3	870	760	--	--	5.8	4.7	15	14	1070	1020	6.6	6.5	.1	.0	21	20
4	880	760	--	--	6.0	4.2	16	14	1150	1070	6.8	6.4	.0	.0	21	20
5	880	800	7.2	6.9	6.3	4.3	15	14	1120	1000	7.0	6.6	.1	.0	20	19
6	920	830	7.0	6.4	4.9	4.4	16	15	1090	970	7.1	6.9	.5	.0	19	19
7	870	830	7.0	6.8	5.1	4.2	16	15	990	900	7.0	6.6	.3	.0	20	19
8	860	820	--	--	6.1	3.8	18	16	1050	950	6.6	6.3	.1	.0	21	20
9	890	850	--	--	5.0	3.2	18	17	1090	1040	6.7	6.6	.1	.0	22	21
10	920	860	--	--	3.8	3.3	19	18	1150	1090	6.7	6.6	.1	.0	22	22
11	1000	910	--	--	5.2	3.5	18	18	1180	1110	6.8	6.5	.0	.0	23	20
12	1040	960	6.8	6.4	5.7	.8	20	18	1110	600	7.1	6.5	2.6	.0	20	15
13	1040	950	7.0	6.7	1.4	.6	21	19	640	540	7.0	6.8	3.2	.7	17	16
14	970	940	7.1	6.8	.7	.5	22	21	660	620	6.9	6.7	1.9	.0	19	17
15	1020	930	--	--	1.0	.4	22	18	750	580	7.1	6.6	1.2	.0	19	14
16	940	900	7.1	6.6	2.5	.9	19	18	580	530	7.0	6.8	2.4	.7	18	16
17	950	890	6.7	6.5	2.6	.7	19	18	600	520	6.9	6.6	4.1	.4	19	18
18	1040	950	6.6	6.5	1.0	.0	21	19	620	580	6.7	6.6	1.7	.0	19	19
19	1190	1040	6.6	6.5	.2	.0	22	20	660	620	6.9	6.4	1.0	.0	19	17
20	1230	1190	6.7	6.6	.1	.0	22	21	740	630	7.3	6.8	5.3	.6	17	16
21	1230	1190	6.9	6.6	.1	.0	22	22	790	680	6.9	6.5	3.9	2.2	18	16
22	1210	1130	7.1	6.9	.2	.0	22	21	840	790	6.8	6.5	2.4	1.1	19	18
23	1220	1060	7.0	6.7	.2	.0	23	21	820	760	6.6	6.4	1.5	.0	20	19
24	1100	800	6.9	6.6	2.4	.0	22	17	860	790	6.6	6.4	1.6	.3	19	19
25	960	800	6.8	6.7	3.0	.9	17	16	880	850	6.7	6.5	.9	.0	20	19
26	870	810	6.8	6.5	4.2	1.3	17	16	940	860	6.9	6.6	.0	.0	21	18
27	960	860	6.9	6.5	3.3	1.2	17	15	810	670	7.0	6.9	5.1	.0	18	15
28	940	850	7.0	6.9	1.7	.0	18	17	670	620	6.9	6.8	5.3	.2	16	14
29	880	820	7.1	6.9	.7	.0	20	18	610	550	7.1	6.8	4.0	2.8	17	16
30	940	860	6.9	6.5	.5	.1	21	19	650	610	7.2	7.1	4.1	2.8	17	17
31	--	--	--	--	--	--	--	--	670	650	7.3	7.1	3.6	1.4	18	17

STREAMS TRIBUTARY TO LAKE ERIE

04208506 CUYAHOGA RIVER AT WEST THIRD STREET BRIDGE, IN CLEVELAND, OHIO--Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Table with columns for DAY, JUNE, JULY, AUGUST, and SEPTEMBER. Each month's data is organized under two sub-headers: SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C) and DISSOLVED OXYGEN (MG/L). Conductance data includes MAX and MIN values, and Dissolved Oxygen data includes MAX and MIN values. Water temperature (TEMPERATURE °C) is also recorded with MAX and MIN values for each day.

04212200 GRAND RIVER AT PAINESVILLE, OHIO

LOCATION.--Lat 41°44'09", long 81°15'59", Lake County, at bridge on State Highway 535 in Painesville, 2.2 miles upstream from mouth, and 8 miles downstream from Kellogg Creek.

DRAINAGE AREA.--701 sq mi.

PERIOD OF RECORD.--Chemical analyses: March 1950 to February 1952, October 1962 to September 1968. Water temperatures: March 1950 to February 1952, October 1962 to September 1968.

EXTREMES.--1967-68:

Specific conductance: Maximum daily, 20,500 micromhos Aug. 10; minimum daily, 400 micromhos Jan. 30.
Dissolved oxygen: Maximum daily, 13.3 mg/l Feb. 5; minimum daily, 0.0 mg/l on several days during July and August.
Water temperatures: Maximum, 33.0°C Aug. 4, 7; minimum, freezing point Jan. 29, 30, Feb. 1, 3, Mar. 10.

Period of record:

Specific conductance: Maximum daily, 30,300 micromhos July 14, 1964; minimum daily, 309 micromhos Dec. 8, 1950.
Dissolved oxygen (1967-68): Maximum daily, 13.3 mg/l Feb. 5, 1968; minimum daily, 0.0 mg/l on several days during July and August 1968.
Water temperatures: Maximum, 33.0°C Aug. 4, 7, 1968; minimum, freezing point on many days during winter periods.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on maximum and minimum specific conductance of samples collected each month. Interruptions in the record were due to malfunctions of the instrument. Diamond Alkali Company and Painesville Sewage Disposal plant are located just above station. Records of discharge are given for Grand River near Madison (drainage area 581 sq mi).

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	NIS-CHARGE (CFS)	RICAN-RONATE (MG/3)	CAP-RONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)
OCT.							
17...	1445	AR	57	0	16P	445P	.5
21...	1650	2230	172	0	4R	395	.4
NOV.							
12...	19 0	217.	92	0	40	120	.2
24...	21 0	52	44	0	92	1250	.3
DEC.							
11...	151	370	64	0	82	148P	.4
25...	21 0	1860	64	0	50	36P	.3
JAN.							
09...	1030	140	62	0	14R	3150	.1
21...	1745	64R	66	0	34	10	.2
FEB.							
26...	1750	7570	48	0	34	10R	.1
27...	2 40	220	8	34	18R	340	.2
MAR.							
11...	1745	200	68	0	140	3450	.1
18...	18 0	3250	47	0	44	400	.2
APR.							
05...	1730	180	66	0	48	340	.2
23...	22 0	34R	38	0	12P	3100	.2
MAY.							
03...	10 0	160	39	0	140	200	.1
18...	1850	1400	77	0	76	500	.1
JUNE.							
04...	16 0	244	64	0	116	1600	.0
26...	1310	50	32	0	14R	6150	.0
JULY.							
12...	1815	26	44	0	164	3000	.1
27...	1900	144	88	0	80	1000	.2
AUG.							
04...	1745	34	64	0	96	3750	.3
21...	1815	344	66	0	92	1240	.0
SEPT.							
03...	1900	24	44	0	96	2700	.1
10...	1830	53	28	0	112	5900	.3

DATE	NITRATE (NO3)	NIS-SULFIDE (RESIDUE AT 100 C)	HARDNESS (CA, MG)	NON-FIC CARBONATE HARDNESS (MG/5)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
OCT.						
17...	--	914	3880	3840	11600	--
21...	3.8	950	418	434	1480	--
NOV.						
12...	3.8	432	170	95	623	--
24...	--	250.	1190	1140	3841	--
DEC.						
11...	--	426.	1380	1330	5041	--
25...	4.2	900	372	319	1290	--
JAN.						
09...	--	6120	2680	2630	8200	--
21...	3.1	382	160	112	402	--
FEB.						
26...	2.9	374	146	107	490	--
27...	--	6640	3190	3120	9690	9.4
MAR.						
11...	--	7610	316	3100	8710	--
18...	5.5	180	342	307	1300	7.7
APR.						
05...	4.1	886	346	262	1230	--
23...	--	6760	2810	2780	844	6.2
MAY.						
03...	--	396	1840	181	6080	6.4
18...	2.8	1110	515	452	183	7.0
JUNE.						
04...	--	308	1450	1410	4760	6.8
26...	--	1360	5740	5710	14700	--
JULY.						
12...	--	6470	3820	3780	10700	7.2
27...	--	3700	1850	1700	6630	7.1
AUG.						
04...	--	4700	3240	3220	10600	--
21...	--	2400	1120	1070	3890	7.3
SEPT.						
03...	--	4900	2280	2240	7670	7.6
10...	--	1100	5360	5340	15100	--

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER								NOVEMBER							
	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	4000	3300	9.1	8.6	7.5	6.7	16	13	8800	6900	8.7	8.5	--	--	16	14
2	6000	4000	9.2	8.6	7.3	6.0	19	16	9600	3100	8.6	8.5	--	--	16	12
3	9800	5000	9.3	8.8	7.8	5.7	21	18	3700	2400	8.7	8.5	--	--	12	11
4	--	--	9.2	8.7	7.4	6.4	23	19	3300	2500	8.6	8.5	--	--	12	8
5	--	--	9.3	8.7	7.1	6.2	24	22	3800	2800	8.7	8.6	--	--	8	3
6	--	--	8.8	8.6	7.7	5.3	23	21	4200	3400	8.7	8.6	--	--	6	3
7	--	--	9.2	8.6	6.3	4.4	23	19	4400	3200	8.7	8.6	--	--	6	3
8	--	--	9.2	8.5	6.3	3.4	23	21	3600	1200	8.7	8.6	--	--	6	3
9	13600	8600	8.9	8.5	5.5	3.1	22	19	1400	1100	8.7	8.5	--	--	6	4
10	13200	10000	9.2	8.5	6.9	5.2	21	19	1100	650	8.8	8.5	--	--	6	4
11	--	--	8.7	8.6	7.4	6.5	20	18	900	800	8.6	8.5	--	--	7	5
12	11000	9200	8.7	8.6	7.4	7.1	19	18	800	700	8.6	8.5	--	--	8	7
13	11400	9600	8.8	8.5	7.7	7.1	20	18	1200	800	8.8	8.6	--	--	8	6
14	11800	10200	8.7	8.5	7.7	6.6	21	19	3480	1180	9.1	8.8	--	--	8	5
15	11400	10400	9.0	8.5	12.0	4.7	22	19	3800	3450	9.8	9.1	12.3	11.6	6	5
16	--	--	9.2	8.5	--	--	23	20	4400	3600	9.6	9.3	12.3	12.2	6	5
17	12000	9600	8.7	8.4	7.7	4.3	22	21	3900	2800	9.7	9.3	12.3	11.9	6	4
18	13100	4300	8.7	8.5	6.8	5.4	22	14	3150	1450	9.3	9.2	12.8	11.2	5	4
19	5100	1500	8.8	8.6	7.9	6.7	14	12	1500	1100	10.1	9.3	13.1	12.8	4	3
20	1700	1300	8.6	8.5	8.1	7.7	12	11	1300	1050	10.1	9.9	13.2	13.0	3	3
21	3100	1400	8.6	8.6	9.8	--	12	11	1700	1200	10.1	9.7	13.0	12.6	4	3
22	3300	1900	9.0	8.6	9.8	9.4	13	11	1850	1650	9.7	9.4	12.6	12.2	5	4
23	5700	3000	9.2	8.6	9.4	9.0	14	12	1850	1450	9.7	9.4	12.5	12.2	5	4
24	6700	3700	9.2	8.5	9.0	8.5	16	13	1550	1350	9.7	9.4	12.5	12.2	5	4
25	8300	6000	8.7	8.5	8.6	8.0	17	13	2300	1550	9.5	9.2	12.3	12.0	6	4
26	8300	7400	8.7	8.5	8.8	8.4	14	13	3100	2300	9.4	9.2	12.0	11.9	7	6
27	10100	7300	8.7	8.6	9.0	8.4	14	11	3700	2800	10.1	9.3	12.2	11.9	6	4
28	10700	9300	8.8	8.6	9.0	8.5	14	11	4050	3350	9.8	9.6	12.5	12.1	4	3
29	10600	7400	8.7	8.5	9.2	8.9	14	12	4700	3700	9.8	9.6	12.6	12.3	6	3
30	8800	7200	9.1	8.5	--	--	16	12	4450	3800	9.9	9.8	12.4	12.1	6	4
31	7700	7400	9.1	8.5	--	--	14	13	--	--	--	--	--	--	--	--

DAY	DECEMBER								JANUARY							
	SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOMS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	5300	4250	9.9	9.8	12.6	12.1	6	4	6200	3550	10.3	10.1	12.5	12.3	3	1
2	5950	4500	10.0	9.8	12.4	12.4	6	4	7410	5810	10.3	10.0	12.5	12.1	4	2
3	5500	2350	9.8	9.8	12.9	12.1	6	3	7600	5750	10.1	10.0	12.4	12.0	3	2
4	2600	1800	10.0	9.8	13.2	12.9	3	2	6680	4580	10.1	9.9	12.3	12.0	4	1
5	1850	1560	10.0	9.9	13.2	12.9	3	2	5180	4580	10.1	9.6	12.2	11.8	4	1
6	1840	1440	9.9	9.8	12.9	12.7	4	3	5950	4700	9.8	9.5	12.1	11.7	4	3
7	1440	1240	10.0	9.7	12.7	12.4	5	4	7400	5700	9.8	9.7	12.3	11.8	3	2
8	1380	1190	10.0	9.8	12.5	12.3	5	4	7700	6900	9.8	9.6	12.3	11.7	4	2
9	1920	1380	10.2	9.9	12.3	12.2	6	5	8800	7300	9.9	9.6	12.1	11.4	4	3
10	2470	1920	10.2	10.0	12.2	11.9	6	4	8200	8000	9.8	9.2	11.9	11.5	4	3
11	2620	2320	10.2	10.1	11.9	11.7	6	6	--	--	10.0	9.7	11.9	11.6	4	3
12	2720	2320	10.1	10.0	11.8	11.6	7	6	--	--	10.1	9.7	12.0	11.4	5	3
13	2560	2360	10.1	10.0	12.0	11.8	7	6	--	--	9.7	9.5	11.8	11.3	5	3
14	3160	2360	10.2	10.0	12.2	11.8	7	4	--	--	9.5	9.3	11.6	11.1	6	3
15	3600	2320	10.2	10.1	12.3	12.0	5	3	--	--	9.8	9.4	11.5	11.0	6	4
16	3800	3400	10.2	10.2	12.3	11.9	4	3	--	--	9.8	9.6	11.8	11.2	5	3
17	4200	3400	10.2	10.1	12.2	11.9	6	4	--	--	9.9	9.7	11.8	11.4	4	3
18	4850	3650	10.1	9.7	12.1	11.4	7	5	--	--	9.8	9.3	11.9	11.6	4	3
19	3600	2650	10.1	9.8	12.1	11.4	7	6	--	--	9.4	9.2	12.0	11.8	3	3
20	2750	2600	10.4	10.0	12.4	12.0	6	4	--	--	9.4	9.2	12.1	11.7	3	2
21	3350	2550	10.1	9.7	12.1	11.1	8	4	--	--	9.3	9.2	12.0	11.8	4	3
22	3400	1650	10.3	9.8	12.2	10.9	9	4	4090	3900	9.2	9.0	12.2	11.9	4	3
23	3350	2100	10.3	10.2	12.6	12.2	4	3	3900	3350	9.0	8.6	12.2	11.9	4	2
24	2300	2100	10.3	10.2	12.7	12.6	3	2	3450	3050	9.2	8.7	12.4	12.0	3	2
25	3300	2200	10.2	10.1	12.6	12.2	3	2	3310	3050	9.3	8.8	12.4	12.1	4	2
26	3300	3100	10.4	10.1	12.8	12.2	3	1	3550	3170	9.2	8.7	12.2	12.0	4	3
27	3540	2940	10.4	10.2	13.0	12.5	3	1	3990	3590	9.0	8.6	12.2	11.9	4	3
28	3640	3290	10.3	10.3	12.9	12.8	2	2	4250	1410	8.6	8.3	13.1	11.9	4	1
29	4440	3390	10.3	10.1	12.9	12.7	2	1	1410	700	8.4	8.2	13.2	12.4	2	0
30	4900	3750	10.3	10.2	12.8	12.4	3	1	700	400	8.6	8.3	12.8	12.3	1	0
31	5250	4000	10.3	10.1	12.6	12.3	3	2	600	550	8.6	8.5	12.6	12.4	1	1

04212200 GRAND RIVER AT PAINESVILLE, OHIO -Continued

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	FEBRUARY								MARCH								
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	550	480	8.8	8.5	12.6	12.1	1	0	10500	7400	8.9	8.6	11.4	11.0	7	5	
2	550	440	9.1	8.4	12.5	11.9	2	1	9800	7700	8.8	8.6	11.3	10.9	6	6	
3	720	510	9.1	8.8	12.9	12.5	1	0	10800	8600	8.8	8.7	11.5	11.1	6	4	
4	800	650	8.9	8.5	13.2	12.9	1	1	11000	7200	8.8	8.6	11.4	10.8	7	4	
5	900	780	8.8	8.6	13.3	13.1	1	1	10800	8600	9.2	8.6	10.9	10.4	9	6	
6	1200	780	9.1	8.5	13.1	12.8	2	1	8800	7000	9.4	9.1	11.2	10.7	7	6	
7	1400	1100	9.0	8.5	13.1	12.8	2	1	8700	7200	9.2	8.9	11.3	11.0	7	5	
8	1600	1200	8.8	8.5	12.9	12.7	2	1	8000	6000	9.2	8.5	11.5	11.3	7	4	
9	2400	1600	9.1	8.5	12.8	12.5	2	1	6000	1700	8.6	8.5	12.4	11.3	4	1	
10	4400	2400	9.2	9.1	12.6	12.3	3	1	1900	900	8.8	8.5	12.6	12.1	2	0	
11	4300	3700	9.1	8.9	12.5	12.2	3	2	1400	1200	9.0	8.6	12.8	12.4	2	1	
12	5500	4000	9.1	8.9	12.5	12.3	3	2	2300	1400	9.4	8.9	12.6	12.1	2	1	
13	5500	4300	9.2	8.8	12.7	12.4	3	2	3600	2300	9.4	9.3	12.2	11.9	3	1	
14	5900	5000	9.2	8.9	12.6	12.2	3	2	4400	3200	9.4	9.1	12.3	12.0	4	2	
15	5500	4600	9.2	8.8	12.4	12.2	3	2	4600	3300	9.2	8.9	12.1	11.8	6	2	
16	5500	5000	9.1	8.7	12.2	11.8	4	3	--	--	--	--	--	--	--	--	
17	7000	5200	9.0	8.7	11.9	11.7	3	1	--	--	--	--	--	--	--	--	
18	7200	5800	8.9	8.8	12.0	11.7	3	1	--	--	--	--	--	--	--	--	
19	7500	6300	8.8	8.7	11.9	11.6	4	2	--	--	--	--	--	--	--	--	
20	6800	5700	9.0	8.7	11.8	11.6	4	3	--	--	--	--	--	--	--	--	
21	7600	6600	9.4	8.9	11.9	11.8	4	2	--	--	--	--	--	--	--	--	
22	9000	7300	9.1	9.0	11.8	11.7	4	3	--	--	--	--	--	--	--	--	
23	8900	6850	9.2	8.7	11.8	11.3	6	3	--	--	--	--	--	--	--	--	
24	8300	6800	9.1	8.8	11.6	11.4	6	4	--	--	--	--	--	--	--	--	
25	7900	6500	9.2	8.7	11.6	11.3	6	4	--	--	--	--	--	--	--	--	
26	8600	7200	9.2	8.8	11.5	11.3	7	5	--	--	--	--	--	--	--	--	
27	10200	7300	9.2	8.9	11.3	10.9	8	6	--	--	--	--	--	--	--	--	
28	8100	6800	9.0	8.8	11.3	11.1	7	6	2100	1600	--	--	11.4	10.5	11	9	
29	8300	7400	8.9	8.8	11.2	11.1	7	6	2600	1600	--	--	10.6	10.0	12	10	
30	--	--	--	--	--	--	--	--	2900	1900	--	--	10.5	10.0	13	11	
31	--	--	--	--	--	--	--	--	3900	2800	--	--	10.0	9.6	13	11	
APRIL								MAY									
DAY		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
		MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	3900	3400	9.3	9.2	10.7	9.6	12	11	6100	2500	8.6	8.2	10.4	8.7	17	14	
2	4100	3400	9.6	9.2	11.0	10.2	11	9	6200	3700	8.5	--	11.2	8.5	18	15	
3	3600	3300	9.7	--	10.6	9.9	13	11	8400	6000	8.6	--	10.0	7.7	18	17	
4	4500	1600	9.6	--	10.0	9.3	14	12	6800	5200	8.6	8.1	9.4	7.9	19	16	
5	1900	1000	9.3	9.0	10.7	9.6	13	10	7400	4000	8.5	8.1	9.4	7.8	19	17	
6	1900	1100	9.4	9.0	11.0	10.4	11	9	6600	3400	8.5	8.2	9.3	8.2	18	15	
7	2400	1900	9.4	9.0	11.0	10.1	11	9	7500	4700	8.5	--	9.5	8.1	18	14	
8	3400	2400	9.4	--	10.1	9.6	13	11	4700	3200	8.6	--	9.8	8.4	20	16	
9	4100	3200	9.4	--	10.7	9.6	14	11	4800	3600	8.5	--	8.6	7.5	21	18	
10	4500	3600	9.1	8.7	10.9	9.3	14	13	8800	4500	8.5	--	8.2	7.3	20	18	
11	4800	4000	9.0	--	11.4	9.5	14	12	6400	6000	8.2	8.0	8.2	7.5	19	17	
12	4100	3400	8.9	--	11.3	9.3	16	13	6200	2600	8.3	8.1	8.9	7.9	17	15	
13	6300	3700	--	--	10.6	8.8	18	14	2600	1500	8.5	--	9.1	8.2	18	14	
14	7000	5900	9.8	--	10.4	8.2	18	16	2400	1300	8.3	8.2	8.8	8.2	18	16	
15	7500	4000	9.5	8.8	9.7	8.3	18	15	2500	1500	8.7	--	9.7	8.4	18	16	
16	5600	3200	9.4	--	10.2	8.7	16	14	3000	1400	9.4	--	8.5	8.2	19	18	
17	5200	4900	9.2	--	10.1	8.7	17	14	--	--	9.4	--	8.7	8.2	18	17	
18	5600	5000	9.0	--	9.9	8.2	17	15	--	--	9.5	--	8.8	8.2	19	17	
19	6200	5500	9.0	--	9.3	8.1	19	16	2500	1600	9.6	9.0	9.1	8.6	17	16	
20	6700	5900	9.0	--	9.2	7.8	18	17	--	--	9.7	9.0	9.3	8.8	16	15	
21	7600	6200	8.9	--	8.6	7.8	18	17	2000	1300	9.7	--	9.4	8.8	17	15	
22	6500	4600	8.9	--	8.6	7.6	19	17	2500	2000	9.5	--	9.3	8.6	18	16	
23	6900	4600	8.8	--	9.0	7.2	20	17	2900	1800	9.3	9.1	8.5	8.4	18	16	
24	8600	1000	8.4	8.2	10.8	9.0	17	12	4600	2000	9.3	9.1	9.1	8.3	18	16	
25	3500	2200	8.8	8.3	11.3	10.5	12	10	4900	3900	--	--	8.9	8.1	20	17	
26	2200	1600	8.8	8.4	11.5	10.9	11	10	5100	4300	8.7	8.4	8.8	7.2	16	14	
27	2200	1700	8.5	8.3	11.5	10.6	14	11	4400	2200	8.7	8.4	7.9	6.8	19	15	
28	3300	1400	8.6	8.2	11.2	10.5	14	12	2600	2200	9.0	--	9.6	7.8	15	13	
29	4200	1800	8.7	--	11.0	10.0	16	13	2200	1200	--	--	9.6	9.3	15	14	
30	6200	3600	8.7	8.2	10.0	8.9	16	14	1800	1200	--	--	9.4	8.8	17	14	
31	--	--	--	--	--	--	--	--	2300	1600	--	--	9.1	8.7	17	16	

04212700 ASHTABULA RIVER AT ASHTABULA, OHIO

LOCATION.--Lat 41°54'00", long 80°47'44", Ashtabula County, on right bank at Jack's Automarine, 600 ft upstream from bridge on State Highway 531, 4,000 ft upstream from mouth, and 4,000 ft downstream from Fields Brook, in Ashtabula.

DRAINAGE AREA.--136 sq mi.

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

EXTREMES.--June to September 1968:
Specific conductance: Maximum daily, 2,530 micromhos June 27; minimum daily, 560 micromhos Aug. 11.
pH: Maximum daily, 8.6 Aug. 30; minimum daily, 4.8 June 30.
Water temperatures: Maximum, 29.0°C Aug. 23, 24; minimum, not determined.

REMARKS.--In addition to the continuous recorder, twice-weekly samples were collected by a local observer. Partial analyses were made on the maximum and minimum specific conductance of the samples collected for the period July to September. Interruptions in the record were due to malfunctions of the instrument. No discharge records available.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, JULY TO SEPTEMBER 1968

DATE	TIME	BICAR- BONATE (HCO ₃)	CAR- BONATE (CO ₃)	SULFATE (SO ₄)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRAT- E (NO ₃)	DIS- SOLVED SOLIDS (RESI- DU- E AT 180 C)	HARD- NESS (CA, MG)	NON- CAR- BONATE NESS	SPECI- FIC CON- DUCTANCE (MICRO- MHOS)	pH
JULY												
09...	2145	104	0	98	580	.0	1.9	1320	350	265	2270	8.1
20...	2300	112	0	41	121	.0	1.0	396	188	96	655	7.6
AUG.												
10...	2200	112	0	98	660	.1	2.3	1460	400	308	2390	--
30...	2100	112	0	41	142	.0	1.4	418	160	68	726	9.1
SEPT.												
14...	2100	116	0	35	114	.1	.9	352	150	55	676	9.1
24...	1610	140	0	83	550	.1	3.2	1160	210	96	2110	9.1

SPECIFIC CONDUCTANCE, pH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, JUNE TO SEPTEMBER 1968

DAY	JUNE							JULY								
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPER- ATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		pH	DISSOLVED OXYGEN (MG/L)		TEMPER- ATURE (°C)			
	MAX	MIN		MAX	MIN	MAX	MIN	MAX	MIN		MAX	MIN	MAX	MIN		
1	--	--	--	--	--	--	--	1520	1130	7.7	7.3	6.0	3.0	25	22	
2	--	--	--	--	--	--	--	1260	1010	7.6	7.5	5.6	5.0	24	23	
3	--	--	--	--	--	--	--	1270	1020	7.5	7.4	5.4	5.0	23	22	
4	--	--	--	--	--	--	--	1360	1030	7.5	7.3	5.8	5.2	23	22	
5	--	--	--	--	--	--	--	1540	1320	7.3	7.3	5.6	4.9	23	22	
6	--	--	--	--	--	--	--	1770	1080	7.6	7.2	5.8	4.2	23	22	
7	--	--	--	--	--	--	--	1530	1170	7.5	7.3	5.8	4.9	24	22	
8	--	--	--	--	--	--	--	1970	1440	7.3	7.2	6.7	5.2	25	23	
9	--	--	--	--	--	--	--	2160	1750	7.2	7.0	7.4	6.9	25	24	
10	--	--	--	--	--	--	--	1940	1340	7.4	7.2	7.0	6.6	24	23	
11	--	--	--	--	--	--	--	1560	600	7.8	7.3	7.4	7.0	24	23	
12	--	--	--	--	--	--	--	1420	730	7.6	7.2	7.7	6.8	25	24	
13	--	--	--	--	--	--	--	1650	890	7.4	7.0	7.7	6.9	25	24	
14	--	--	--	--	--	--	--	2110	900	7.3	6.9	8.8	7.5	26	24	
15	--	--	--	--	--	--	--	1910	690	7.4	7.0	8.3	7.2	25	23	
16	--	--	--	--	--	--	--	1500	750	7.5	7.0	7.6	6.3	26	24	
17	--	--	--	--	--	--	--	2480	1030	7.4	6.7	--	--	26	24	
18	--	--	--	--	--	--	--	2070	1200	7.2	6.8	--	--	27	25	
19	--	--	--	--	--	--	--	2330	1400	7.4	7.1	--	--	26	25	
20	--	--	--	--	--	--	--	2330	650	7.7	7.3	--	--	26	24	
21	--	--	--	--	--	--	--	1910	650	7.7	7.1	--	--	26	25	
22	--	--	--	--	--	--	--	1740	1500	7.2	7.0	--	--	26	25	
23	--	--	--	--	--	--	--	1870	1330	7.3	7.0	--	--	26	26	
24	--	--	--	--	--	--	--	2190	1220	7.4	6.6	--	--	26	25	
25	--	--	--	--	--	--	--	2360	1040	7.5	6.9	--	--	26	25	
26	--	--	--	--	--	--	--	1550	910	7.6	7.3	--	--	26	25	
27	2530	2200	7.6	7.5	2.7	1.4	23	23	1640	840	7.6	7.3	--	--	26	25
28	2510	2010	7.6	7.5	3.9	1.7	23	22	1650	1320	7.4	7.3	--	--	26	26
29	2120	1900	7.6	4.9	4.7	3.3	22	21	1800	1200	7.4	7.2	--	--	26	25
30	1910	1460	7.7	4.8	4.9	1.9	24	22	1980	1250	7.4	7.2	--	--	26	25
31	--	--	--	--	--	--	--	1800	1440	7.3	7.2	--	--	26	25	

STREAMS TRIBUTARY TO LAKE ERIE

04212700 ASHTABULA RIVER AT ASHTABULA, OHIO--Continued

SPECIFIC CONDUCTANCE, PH, DISSOLVED OXYGEN, AND WATER TEMPERATURES, JUNE TO SEPTEMBER 1968

DAY	AUGUST								SEPTEMBER							
	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		PH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)		SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)		PH		DISSOLVED OXYGEN (MG/L)		TEMPERATURE (°C)	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	1840	1010	7.6	7.3	---	---	26	25	1180	800	8.4	8.3	7.1	5.8	24	23
2	1610	630	8.4	7.4	---	---	25	25	1470	1110	8.3	7.8	5.9	5.0	23	23
3	1320	810	8.2	7.8	---	---	26	25	1750	820	8.0	7.7	5.7	4.7	23	23
4	1740	1320	8.0	7.5	---	---	27	26	1330	700	8.1	7.7	6.6	5.2	24	23
5	2070	1520	7.5	7.2	---	---	28	26	1170	770	8.1	7.6	---	---	24	23
6	1650	1140	7.5	7.1	---	---	26	25	1820	1150	6.9	7.9	---	---	24	23
7	1490	1170	7.3	7.1	---	---	26	25	2210	1340	8.1	7.7	---	---	24	23
8	1660	1310	7.3	7.2	---	---	27	26	1750	1630	7.9	7.0	---	---	24	23
9	1880	1470	7.4	7.1	---	---	27	26	1870	1540	7.8	7.6	---	---	24	23
10	2340	1570	7.3	7.1	---	---	28	27	2050	1640	7.6	7.5	---	---	23	23
11	2340	560	8.1	7.2	---	---	27	25	2210	1240	7.7	7.4	---	---	23	22
12	1150	620	8.1	7.5	7.8	4.9	25	24	1980	730	8.1	7.6	---	---	23	21
13	1270	800	7.7	7.4	6.6	5.8	25	24	1410	750	8.2	7.8	---	---	22	21
14	1170	830	7.7	7.4	5.8	4.2	25	24	1010	630	8.2	7.9	---	---	22	21
15	1690	960	7.6	7.4	4.9	4.2	25	24	1080	650	8.3	8.0	---	---	23	22
16	1390	960	7.7	7.1	4.7	2.8	25	24	1140	790	8.2	7.9	---	---	23	22
17	1660	1360	7.3	7.1	3.0	2.2	26	25	1410	1070	8.2	7.8	---	---	23	22
18	1870	960	7.7	7.2	3.8	2.2	26	25	1730	1340	8.1	7.8	---	---	23	23
19	2060	1120	7.6	7.1	3.4	1.8	26	25	2210	1650	7.8	7.6	---	---	23	23
20	2260	2050	7.4	7.0	2.2	1.4	27	26	2090	1640	7.9	7.6	---	---	23	22
21	2280	890	8.0	7.2	4.5	1.9	27	26	2140	950	8.1	7.6	---	---	23	22
22	1910	980	7.9	7.3	4.3	2.4	28	26	1660	1030	8.2	7.9	---	---	24	22
23	1660	1410	7.5	7.3	2.8	2.3	29	27	2020	1620	8.0	7.8	---	---	24	23
24	1450	1070	7.6	7.4	3.4	2.5	29	27	2140	1900	8.2	7.7	3.7	2.5	25	24
25	1140	1020	7.6	7.5	3.2	2.9	28	26	2190	1590	7.9	7.6	2.7	1.9	24	24
26	1280	1070	7.6	7.5	3.4	3.1	26	25	2190	1560	7.6	7.4	2.5	2.0	24	22
27	1480	1090	7.9	7.4	4.6	3.4	25	24	2120	1304	7.7	7.5	2.6	2.2	23	22
28	1450	720	8.4	7.6	6.3	4.2	24	24	1880	950	7.9	7.5	3.1	2.1	22	21
29	990	590	8.4	8.2	6.8	5.8	24	24	1370	800	8.0	7.7	3.3	3.0	22	21
30	1240	710	8.6	8.0	7.3	5.8	24	24	1470	1240	7.9	7.7	3.1	2.7	21	21
31	1070	710	8.5	8.3	7.2	6.3	24	23	---	---	---	---	---	---	---	---

04214500 BUFFALO CREEK AT GARDENVILLE, N.Y.

LOCATION (revised).--Lat 42°51'16", long 78°45'22", Erie County, at gaging station in Gardenville, 300 ft downstream from bridge on Union Road, and 2 miles upstream from Cayuga Creek.

DRAINAGE AREA.--144 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1961 to September 1962, July 1966 to September 1968. Water temperatures: October 1961 to September 1962.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SiO2)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)	SULFATE (SO4)	CHLORIDE (Cl)	FLUORIDE (F)
23...	1435	166	--	58	16	--	--	--	154	58	14	--
NOV.	1505	272	--	44	7.9	--	--	--	117	44	13	--
DEC.	1655	142	--	49	8.9	--	--	--	132	44	13	--
JAN.	1130	100	4.3	57	9.8	18	2.4	--	148	61	34	.2
FEB.	1345	50	--	60	12	--	--	--	175	47	16	--
MAR.	1630	966	4.0	33	5.8	7.4	2.0	--	84	31	16	.1
APR.	1405	64	--	54	12	9.4	1.9	--	156	47	17	--
MAY	1517	86	--	44	9.9	--	--	--	132	--	12	--
JUNE	1200	20	--	35	25	--	--	--	158	43	17	--
JULY	1415	18	--	46	13	--	--	.76	134	48	19	--
AUG.	1120	9.2	--	50	14	--	--	.32	154	54	19	.1
SEPT.	1615	9.2	--	43	14	--	--	.65	128	56	20	.1
DATE	NITRIF (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (NI)	TOTAL PHOSPHORUS (PO4)	SOLVED PHOSPHORUS (RESIDUE AT 180 C)	HARDNESS (Ca, Mg)	NON-CARBONATE HARDNESS	ALKALINITY AS CaCO3	CONDUCTANCE (MICROMHOS)	PH	COLOR	TEMPERATURE (°F C)
23...	--	--	--	--	--	186	60	126	402	7.6	--	8
NOV.	--	--	--	--	--	143	47	96	320	7.5	--	2
DEC.	--	--	--	--	--	159	51	108	338	7.6	--	2
JAN.	--	2.1	--	--	--	288	183	121	475	7.6	4	0
FEB.	--	--	--	--	--	199	95	144	427	7.9	--	0
MAR.	--	2.9	--	--	--	147	106	69	257	7.5	25	2
APR.	--	--	--	--	--	186	58	128	394	7.8	--	13
MAY	--	--	--	--	--	151	43	108	330	7.9	--	21
JUNE	--	--	--	--	--	190	60	130	395	7.9	--	19
JULY	0.0	.4	.11	.18	--	168	58	110	376	7.8	--	23
AUG.	0.2	.1	.20	.29	--	183	56	126	400	8.0	--	23
SEPT.	.17	.1	.14	.54	--	165	60	105	375	7.9	--	24

STREAMS TRIBUTARY TO LAKE ONTARIO

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04231000 BLACK CREEK AT CHURCHVILLE, N.Y.

LOCATION (revised).--Lat 43°06'02", long 77°52'57", Monroe County, at gaging station at east end of Carrol Street in Churchville, 100 ft downstream from main-line tracks of Penn-Central Transportation Co.

DRAINAGE AREA.--123 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1961 to September 1962, August 1966 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)
OCT.												
24...	1525	132	--	120	27	--	--	--	240	183	36	--
NOV.												
22...	1400	237	7.0	108	31	8.0	2.3	--	250	156	21	.1
DEC.												
21...	1410	172	--	128	26	--	--	--	271	187	41	--
JAN.												
24...	1140	99	--	164	39	--	--	--	322	273	61	--
FEB.												
21...	1040	83	--	176	39	--	--	--	340	282	45	--
MAR.												
21...	1015	625	4.3	84	20	13	2.5	--	196	112	28	.2
APR.												
23...	0915	66	--	160	34	--	--	--	290	262	45	--
MAY												
21...	0950	189	--	100	56	--	--	--	296	206	36	--
JUNE												
20...	1320	21	--	154	41	--	--	--	256	341	45	--
JULY												
23...	1505	5.5	--	156	37	--	--	.08	224	284	60	--
AUG.												
21...	0815	30	5.6	156	56	36	3.0	.12	186	549	57	.3
SEPT.												
23...	1400	9.8	2.2	222	45	22	3.0	.05	200	521	54	.3

DATE	NITRATE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	ALKALINITY AS CaCO3	SPECIFIC CONDUCTANCE (MICROMHOS)	pH	CCLCR	TEMPERATURE (EEC C)
OCT.												
24...	--	--	--	--	--	410	213	197	797	7.8	--	9
NOV.												
22...	--	3.7	--	--	475	358	193	205	767	7.9	25	2
DEC.												
21...	--	--	--	--	--	441	219	222	869	8.0	--	3
JAN.												
24...	--	--	--	--	--	570	306	264	1070	7.7	--	0
FEB.												
21...	--	--	--	--	--	600	321	279	1130	7.8	--	0
MAR.												
21...	--	4.4	--	--	364	292	131	161	587	7.8	5	4
APR.												
23...	--	--	--	--	--	540	302	238	998	8.0	--	15
MAY												
21...	--	--	--	--	--	480	237	243	853	8.0	--	12
JUNE												
20...	--	--	--	--	--	578	368	210	1090	8.0	--	17
JULY												
23...	.01	1.6	.44	.73	--	540	356	184	1000	7.5	--	--
AUG.												
21...	.06	.5	.31	.33	556	720	568	153	1210	7.5	19	21
SEPT.												
23...	.34	1.7	.20	.46	985	740	575	164	1300	8.0	18	--

04232000 GENESEE RIVER AT ROCHESTER, N.Y.
(Formerly published as Genesee River at Driving Park Avenue, Rochester, N.Y.)

LOCATION.--Lat 43°10'50", long 77°37'40", Monroe County, at gaging station on right bank at Rochester, 40 ft downstream from plant 5 of Rochester Gas and Electric Corp., and 100 ft upstream from Driving Park Avenue Bridge.

DRAINAGE AREA.--2,457 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1954 to September 1955.

Water temperatures: October 1954 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 27.0°C July 22, 23; minimum, freezing point Jan. 16, 26.

Period of record:

Water temperatures: Maximum, 30.5°C Aug. 18, 1955; minimum, (1954-64, 1966-68) freezing point on several days in 1955-56, 1960, 1962-63, and 1968.

REMARKS.--Water temperature records furnished by the Rochester Gas and Electric Corp.

STREAMS TRIBUTARY TO LAKE ONTARIO

04232000 GENESEE RIVER AT ROCHESTER, N.Y.--Continued
 TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (TWICE-DAILY MEASUREMENTS AT 1030 AND 1630)

MONTH	DAY																															AVFR-AGE			
	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				
OCTOBER																																			
AM.....	13	15	15	14	15	15	14	14	13	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	
PM.....	13	14	14	13	14	14	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
NOVEMBER																																			
AM.....	11	11	9	9	9	8	7	7	7	7	7	7	7	7	6	5	4	4	4	2	3	3	3	3	3	3	3	3	3	3	2	--	6		
PM.....	11	11	8	8	8	8	7	7	6	7	7	7	6	5	5	4	4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	--	5		
DECEMBER																																			
AM.....	3	3	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	3		
PM.....	3	3	2	2	2	2	2	2	2	2	2	3	4	5	4	4	4	4	4	3	4	3	3	3	3	3	3	2	2	2	2	2	1	3	
JANUARY																																			
AM.....	2	2	3	3	2	2	1	1	2	2	2	1	1	1	1	0	1	2	2	2	2	3	2	1	1	0	1	2	3	2	1	2	2		
PM.....	2	2	3	3	2	2	1	1	1	1	1	1	1	1	1	2	2	0	2	3	2	2	2	2	2	1	1	1	1	2	2	1	2		
FEBRUARY																																			
AM.....	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	1	2	2	2	1	1	2	2	2	2	2	2	2	--	2		
PM.....	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	--	2		
MARCH																																			
AM.....	2	2	1	1	2	1	1	2	3	3	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	4	3	10	3	7		
PM.....	1	1	1	1	1	1	1	1	2	3	1	1	1	2	2	2	2	3	2	3	4	3	3	3	3	3	3	3	3	4	6	9	2		
APRIL																																			
AM.....	10	9	8	8	8	8	8	9	9	11	11	11	11	12	13	13	12	13	12	13	12	12	11	9	10	10	11	11	11	--	--	11	--		
PM.....	9	9	8	8	8	8	8	9	11	11	11	11	11	12	12	12	12	12	12	12	12	12	11	12	10	10	10	10	10	11	--	--	11		
MAY																																			
AM.....	10	10	13	10	10	9	10	11	11	10	12	13	14	13	13	15	14	14	15	13	13	13	13	13	13	13	13	13	13	13	14	14	12	12	
PM.....	10	10	11	11	11	10	10	11	11	11	11	13	13	13	13	14	13	13	14	13	13	13	13	13	13	13	13	13	13	13	14	14	17	17	
JUNE																																			
AM.....	14	14	16	16	18	19	19	22	22	21	23	23	22	22	22	21	21	21	19	20	20	19	19	20	20	19	19	18	19	19	21	--	20		
PM.....	14	14	17	17	18	18	19	22	23	22	24	24	22	22	21	21	21	20	20	20	20	19	20	20	19	19	18	18	19	20	--	20			
JULY																																			
AM.....	21	22	22	21	21	21	21	21	21	23	22	23	23	24	25	25	26	26	26	26	26	27	27	25	24	25	24	24	23	23	23	24	24		
PM.....	22	22	21	21	21	21	21	21	22	22	22	23	24	25	25	25	26	26	26	26	27	27	26	26	26	26	26	26	26	26	26	26	26	26	
AUGUST																																			
AM.....	23	23	23	26	25	25	26	26	26	26	26	26	26	26	26	23	23	23	23	22	23	23	25	24	24	23	22	22	22	21	21	24	24		
PM.....	23	23	24	25	25	25	26	26	26	26	26	26	26	26	26	24	24	24	23	23	23	23	25	24	24	23	22	22	21	21	24	24			
SEPTEMBER																																			
AM.....	23	22	21	23	23	23	23	23	23	22	22	22	22	20	21	22	22	22	22	22	22	22	25	24	26	24	23	22	22	19	--	--	22		
PM.....	23	22	23	24	24	23	23	23	22	21	21	21	21	21	19	21	22	22	22	22	22	22	24	24	24	23	23	21	21	20	--	--	22		

04237500 SENECA RIVER AT BALDWINVILLE, N.Y.

LOCATION (revised).-- 09°26", long 76°19'55", Onondaga County, at Erie (Barge) Canal lock 24 in Baldwinsville, 350 ft upstream from aging station.

DRAINAGE AREA.--3,136 sq mi (revised).

PERIOD OF RECORD.--Chemical analyses: October 1957 to September 1958.
 Water temperatures: October 1957 to September 1968.

EXTREMES.--1967-68:
 Water temperatures: Maximum, 26.0°C on several days during July and August; minimum, freezing point on many days during January to March.

Period of record:
 Water temperatures: Maximum, 28.0°C July 24, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--Stream frozen Jan. 8 to 31, Feb. 10 to Mar. 18. Water temperature record furnished by the New York State Department of Transportation.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (ONCE-DAILY MEASUREMENT AT APPROXIMATELY 0800)

MONTH	DAY																															AVER-AGE	
	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		
OCTOBER..	17	17	20	18	16	18	16	16	16	15	15	14	14	13	14	15	16	14	13	12	12	12	12	13	12	12	10	9	9	9	14		
NOVEMBER.	10	11	11	9	9	8	8	8	8	7	8	7	6	6	5	5	4	4	4	4	4	4	4	4	4	4	4	3	3	--	6		
DECEMBER.	2	2	2	3	3	3	3	--	--	3	3	4	3	3	--	--	3	3	3	3	--	--	--	3	2	1	1	--	--	--	--		
JANUARY..	--	0	1	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
FEBRUARY.	--	2	--	--	2	1	1	1	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MARCH....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
APRIL.....	7	8	8	8	8	--	--	9	--	8	8	9	--	--	12	12	12	12	12	13	14	15	13	13	12	12	12	12	--	--	11		
MAY.....	12	12	12	13	12	12	12	13	12	13	14	14	13	13	14	15	15	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
JUNE.....	--	--	16	17	18	19	20	21	22	22	21	22	22	21	24	21	19	19	20	19	18	19	19	20	20	19	18	18	15	19	--	20	
JULY.....	19	20	21	20	21	21	20	21	22	22	23	24	24	24	24	26	26	26	25	24	25	26	26	24	24	24	25	25	24	23	24	23	
AUGUST....	24	24	24	25	25	26	26	26	26	25	24	23	24	24	23	23	23	23	22	23	23	23	23	24	23	23	22	22	21	22	24	24	
SEPTEMBER	22	22	22	21	22	21	21	21	21	21	20	19	19	20	20	20	21	21	21	21	21	21	21	22	22	21	21	19	19	19	--	21	

STREAMS TRIBUTARY TO LAKE ONTARIO

04241200 WEST BRANCH FISH CREEK AT BLOSSVALE, N.Y.

LOCATION.--Lat 43°16'28", long 75°39'03" (revised), Oneida County, at gaging station at bridge on McConnellsville-Blossvale Road, 0.4 mile southwest of Blossvale, and 2.5 miles east of McConnellsville.

DRAINAGE AREA.--203 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance, and pH of some samples in file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HC03)	CARBONATE (C03)	SULFATE (SO4)
DEC.												
1E...	1205	611	3.8	9.6	3.4	.00	1.5	.3	.00	31	0	9.9
JAN.												
1E...	--	310	4.7	9.9	5.0	.02	1.9	.5	.00	44	0	13
FEB.												
1E...	--	500	4.0	8.3	3.2	.02	1.5	.4	.00	30	0	10
14...	--	320	4.5	11	4.1	.04	1.8	.5	.02	41	0	11
25...	--	270	4.8	12	4.5	.06	2.0	.4	.01	48	0	10
MAR.												
20...	1120	1450	3.1	6.8	2.4	.03	1.3	.5	.03	22	0	12
APR.												
1E...	1055	2550	2.2	5.1	1.7	.03	.8	.3	.14	14	0	8.8
1E...	0930	460	2.3	10	3.6	.04	1.7	.6	.12	38	0	9.6
MAY												
01...	0930	460	2.3	11	3.8	.05	1.6	.4	.02	42	0	9.0
22...	1500	513	2.5	10	3.4	.00	1.5	.4	.15	34	0	12
JUNE												
04...	1300	320	2.7	11	4.0	.04	1.7	.4	.08	45	0	6.4
JULY												
3E...	1230	225	4.1	14	4.7	.00	1.7	.4	.00	52	0	8.8

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SILICIOUS (SUM OF CONSTITUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC.												
1E...	2.5	.1	.01	.9	.22	.04	47	38	12	80	7.3	1
JAN.												
1E...	3.7	.1	.00	1.7	.00	.36	63	45	9	106	7.3	0
FEB.												
1E...	3.7	.1	.01	1.4	.00	.03	48	34	9	82	7.2	0
14...	4.0	.2	.01	1.4	.04	.08	59	44	10	103	7.3	0
25...	4.8	.1	.00	1.3	.04	.00	64	48	9	110	7.5	0
MAR.												
20...	3.0	.1	.01	1.3	.20	.06	42	27	9	64	6.8	1
APR.												
0E...	1.7	.1	.01	.6	.06	.17	28	20	8	47	6.8	--
1E...	3.9	.2	.00	.8	.14	.90	53	40	9	92	7.1	11
MAY												
1E...	3.0	.2	.00	.9	.22	.13	53	43	8	96	7.3	11
22...	1.9	.1	.00	.9	.00	.04	50	39	11	85	7.0	13
JUNE												
04...	1.9	.1	.00	1.1	.14	.16	52	44	7	93	7.2	17
JULY												
30...	2.8	.2	.00	1.0	.04	.07	64	54	12	110	7.0	18

04242500 EAST BRANCH FISH CREEK AT TABERG, N.Y.

LOCATION (revised).--Lat 43°18'08", long 75°37'09", Oneida County, at gaging station at bridge at Taberg, just downstream from Furnace Creek 300 ft upstream from bridge on State Highway 69, and 2.8 miles upstream from confluence of East and West Branches near Blossvale.

DRAINAGE AREA.--188 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1966 to July 1968 (discontinued).
Water temperatures: July 1966 to June 1967.

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HC03)	CARBONATE (C03)	SULFATE (SO4)
DEC.												
18...	1230	558	3.4	7.9	2.3	.00	1.1	.1	.00	25	0	9.5
JAN.												
1E...	--	230	4.0	9.0	3.4	.01	.9	.3	.00	30	0	13
FEB.												
01...	--	450	4.1	8.1	2.6	.02	1.2	.2	.00	29	0	9.4
14...	--	240	3.8	8.6	2.7	.02	.9	.2	.00	29	0	8.4
29...	--	210	--	--	--	--	--	--	.08	--	--	--
MAR.												
20...	1200	1170	3.6	7.9	2.2	.04	1.0	.3	.00	24	0	9.4
APR.												
0E...	1030	3080	2.3	4.3	1.1	.04	.6	.3	.29	12	0	9.6
1E...	0945	1100	2.2	5.1	1.4	.03	.7	.3	.04	16	0	6.4
MAY												
01...	0950	446	1.7	7.5	2.0	.05	.8	.2	.00	26	0	7.2
22...	1530	558	1.4	8.2	2.0	.00	.8	.3	.00	27	0	5.8
JUNE												
04...	1230	277	1.8	9.2	2.6	.04	.9	.4	.08	36	0	3.4
JULY												
30...	1200	111	3.0	13	3.6	.00	1.3	.4	.24	48	0	7.8

STREAMS TRIBUTARY TO LAKE ONTARIO

04242500 EAST BRANCH FISH CREEK AT TABERG, N.Y.--Continued
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA,MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC. 18...	2.0	.1	.01	.9	.44	.24	40	29	8	63	7.3	2
JAN. 16...	1.8	.0	.00	1.6	.00	.29	49	36	11	74	7.3	0
FEB. 01...	2.1	.1	.00	1.3	.01	.26	43	30	6	75	7.3	0
14...	2.2	.1	.00	1.3	.00	.09	42	32	8	75	7.4	0
29...	---	---	.00	1.3	.02	.00	---	---	---	---	---	---
MAR. 20...	1.8	.1	.00	1.6	.03	.05	40	28	9	64	6.8	0
APR. 02...	1.0	.1	.01	1.8	.49	.15	27	15	5	38	7.2	---
16...	2.0	.1	.00	.8	.11	.04	27	18	6	45	7.0	8
MAY 01...	1.7	.2	.00	.7	.21	.02	35	26	5	61	7.2	8
22...	.5	.0	.00	.6	.14	.00	33	28	6	59	7.3	15
JUNE 04...	1.1	.1	.00	.8	.06	.05	38	34	4	68	7.4	16
JULY 30...	1.8	.2	.00	.7	.30	.00	56	48	8	97	7.1	17

04242800 WOOD CREEK NEAR NEW LONDON, N.Y.

LOCATION: --Lat 43°13'18", long 75°35'38", Oneida County, at bridge on State Highway 49, 1.2 miles north of New London and 4.8 miles upstream from Erie (Barge) Canal.

PERIOD OF RECORD: --Chemical analyses: October 1967 to July 1968 (discontinued).

REMARKS: --Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DISCHARGE (CFS)	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)
GCT. 10...	1140	64	4.7	37	8.1	.46	20	1.7	.00	113	0	14
NOV. 13...	1515	443	4.0	20	4.9	.04	3.7	1.0	.02	64	0	13
DEC. 13...	1400	687	3.3	13	4.1	.06	4.1	.8	.00	52	0	15
JAN. 19...	1100	120	5.0	36	9.1	.22	8.4	1.2	.16	124	0	26
FEB. 01...	1020	233	4.4	27	6.8	.15	10	1.1	.06	82	0	21
19...	1600	103	4.9	35	10	.21	10	1.2	.01	118	0	23
MAR. 01...	1205	135	5.0	38	9.9	.25	24	1.2	.15	122	0	25
20...	1230	587	3.0	15	3.8	.10	3.4	1.0	.02	46	0	15
APR. 03...	1400	167	2.9	26	6.8	.16	6.0	1.0	.00	86	0	19
16...	1030	98	2.8	38	8.4	.26	7.7	1.2	.05	120	0	29
MAY 01...	1115	94	2.6	31	7.5	.17	7.4	1.1	.08	106	0	15
22...	1245	130	3.2	27	6.5	.08	5.8	.9	.04	93	0	13
JUNE 07...	0930	54	2.3	33	8.2	.15	6.7	1.1	.00	120	0	16
JULY 30...	---	75	4.5	27	6.4	.05	4.7	1.0	.21	102	0	12

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA,MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
GCT. 10...	40	.2	.01	1.8	.03	1.5	185	126	34	343	7.8	13
NOV. 13...	6.0	.2	.00	1.2	.12	.08	85	70	18	149	7.5	6
DEC. 13...	6.1	.1	.02	1.3	.21	.78	75	50	7	137	7.5	2
JAN. 19...	18	.1	.07	4.2	.00	.32	170	128	26	307	7.6	0
FEB. 01...	20	.1	.02	1.8	.07	.02	132	96	29	239	7.5	0
15...	19	.2	.02	3.8	.27	.05	165	129	32	300	8.0	0
MAR. 01...	42	.1	.01	3.6	.09	.02	209	136	36	378	7.5	0
20...	7.0	.1	.02	1.3	.13	.04	73	53	15	126	7.2	1
APR. 02...	12	.1	.01	2.2	.08	.11	118	93	22	220	7.5	8
16...	15	.2	.00	1.9	.05	.19	164	130	31	299	7.6	9
MAY 01...	16	.2	.02	2.1	.15	.06	135	108	22	248	7.9	10
22...	9.9	.1	.03	1.4	.12	.04	114	94	18	208	7.7	13
JUNE 07...	12	.2	.04	1.8	.04	.23	141	116	18	260	7.6	15
JULY 30...	8.8	.3	.01	1.7	.10	.20	117	94	10	211	7.5	16

STREAMS TRIBUTARY TO LAKE ONTARIO

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04242860 ERIE (BARGE) CANAL AT SYLVAN BEACH, N.Y.

LOCATION.--Lat 43°11'42", long 75°43'45", Oneida County, at bridge on State Highway 13 at Sylvan Beach.

PERIOD OF RECORD.--Chemical analyses: December 1967 to February 1968 (discontinued).

REMARKS.--This site is a winter auxiliary sampling site for station 04245900 Oneida Lake, USGS Station No. 9.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO FEBRUARY 1968

DATE	TIME	DEPTH (FT)	TEMP-ERATURE (DEG C)	DISS-OLVED OXYGEN	SILICA (SI02)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)
DEC.												
04...	1700	0	1	13.2	4.3	22	6.2	.14	3.9	.8	.00	69
18...	1130	0	1	--	3.8	12	3.5	.01	2.1	.4	.00	38
JAN.												
16...	1615	0	0	--	4.7	15	5.5	.05	2.6	.6	.00	58
30...	1410	0	0	13.2	4.6	16	5.2	.08	2.6	.3	.13	59
FEB.												
13...	1445	0	0	--	4.4	14	4.8	.06	2.3	.5	.00	50

DATE	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO-GEN	TOTAL PHOS-PHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	HARD-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH
DEC.												
04...	23	7.2	.1	.00	1.4	.10	.34	103	90	24	181	7.7
18...	11	3.5	.1	.01	1.1	.21	.16	57	44	14	98	7.3
JAN.												
16...	13	5.1	.1	.02	2.0	.00	.33	77	60	12	139	7.5
30...	13	6.0	.1	.01	1.8	.03	.02	79	62	13	137	7.4
FEB.												
13...	16	5.5	.2	.00	1.5	.01	.06	73	54	14	124	7.3

04243390 SCORNDONDA CREEK AT VERNON CENTER, N.Y.

LOCATION.--Lat 43°03'35", long 75°21'00", Oneida County, at bridge on Oneida Road, 0.4 mile southwest of Stuhlman Road, 0.9 mile northwest of Vernon Center.

PERIOD OF RECORD.--Chemical analyses: December 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO JULY 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SI02)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)
DEC.												
12...	1530	38	3.8	134	32	3.2	5.5	1.4	.02	244	0	265
JAN.												
15...	1530	25	4.4	188	36	4.9	5.7	1.5	.08	264	0	390
FEB.												
01...	1600	60	4.3	134	28	2.9	4.4	1.4	.02	278	0	198
16...	1200	28	4.9	170	34	3.8	5.2	1.5	.00	278	0	339
28...	1540	22	4.7	186	34	3.9	5.6	1.4	.10	248	0	386
MAR.												
20...	1715	158	3.6	83	18	1.5	3.1	1.8	.00	223	0	93
APR.												
03...	1600	48	3.3	124	27	3.0	4.1	1.6	.00	238	0	217
15...	1030	30	2.4	170	32	3.8	4.7	1.4	.08	244	0	338
30...	1130	23	3.0	181	34	4.3	5.2	1.6	.02	220	0	382
MAY												
21...	1135	29	3.9	160	35	3.8	5.8	1.5	.16	240	0	338
JUNE												
06...	1430	15	2.3	192	36	4.8	6.7	1.9	.00	208	0	460
27...	1345	152	5.5	108	23	2.0	3.4	2.0	--	292	0	117
JULY												
30...	1140	11	4.8	210	39	6.6	6.9	1.9	.04	216	0	490

DATE	CHLO-RIDE (CL)	FLUO-RIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO-GEN	TOTAL PHOS-PHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	HARD-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH	TEMP-ERATURE (DEG C)
DEC.												
12...	8.3	.2	.02	6.1	.41	.36	580	466	264	872	7.9	2
JAN.												
15...	12	.2	.01	6.6	.09	.45	780	617	401	1090	7.9	0
FEB.												
01...	11	.1	.02	6.1	.01	.07	527	450	222	782	8.1	3
16...	12	.2	.01	5.0	.15	.05	713	564	336	1030	7.8	0
28...	12	.1	.00	4.5	.05	.00	760	604	401	1070	8.0	0
MAR.												
20...	8.0	.1	.03	4.5	.03	.04	327	281	98	544	7.9	6
APR.												
03...	9.1	.2	.00	4.5	.14	.28	511	421	226	775	7.7	12
15...	10	.2	.00	3.9	.16	.02	686	556	356	928	7.7	9
30...	11	.2	.00	4.3	.02	.00	735	592	412	1020	7.9	16
MAY												
21...	11	.1	.00	3.3	.18	.00	680	543	347	959	7.8	11
JUNE												
06...	13	.2	.00	2.0	.05	.13	821	628	457	1120	8.0	16
27...	7.6	.0	.03	7.3	--	.04	420	364	125	664	7.9	13
JULY												
30...	13	.3	.00	1.9	.06	.11	880	685	508	1210	7.6	21

STREAMS TRIBUTARY TO LAKE ONTARIO

04243530 ONEIDA CREEK AT ONEIDA VALLEY, N.Y.

LOCATION.--Lat 43°09'15", long 75°43'17", Madison County, at bridge on State Highway 31, in Oneida Valley.

DRAINAGE AREA.--144 sq mi.

PERIOD OF RECORD.--Chemical analyses: March 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE CCT.	TIME	DIS- CHARGE (CFS)	SILICA [SiO ₂]	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH ₄)	BICAR- BONATE (HCO ₃)	CAR- BONATE (CO ₃)	SULFATE (SO ₄)
10...	1045	38	3.8	149	26	3.5	18	3.5	.38	264	0	273
13...	1435	--	5.2	88	21	1.5	8.2	2.8	.34	256	0	101
DEC.												
13...	1545	598	4.1	75	18	.96	7.2	2.2	.07	224	0	67
JAN.												
19...	1430	93	5.1	124	29	2.9	10	2.0	.44	291	0	195
FEB.												
02...	0915	--	4.2	70	18	1.1	8.7	2.0	.00	206	0	75
16...	1415	54	4.9	129	29	2.6	11	1.9	.25	293	0	187
MAR.												
01...	1045	85	4.9	131	29	3.0	14	2.1	.37	285	0	211
20...	1500	754	3.6	63	15	.84	5.8	1.9	.11	186	0	58
APR.												
03...	1300	237	2.9	88	21	1.6	7.7	1.7	.06	252	0	96
16...	1130	132	.8	113	26	2.3	10	1.9	.12	262	0	164
MAY												
01...	1400	116	.5	117	26	2.6	12	2.2	.04	262	0	174
22...	1330	163	3.5	101	24	1.8	10	1.8	.24	266	0	134
JUNE												
06...	1600	76	1.5	110	27	2.5	16	2.1	.26	258	0	178
28...	1515	1900	4.9	57	13	.08	4.6	2.6	--	179	0	45
JULY												
30...	0930	56	1.5	117	29	2.8	15	2.5	.24	252	0	200

DATE OCT.	TIME	CHLOR- RIDE (CL)	FLUOR- IDE (F)	NITRITE (NO ₂)	NITRATE (NO ₃)	ORGANIC NITRO- GEN (N)	TOTAL PHOS- PHORUS (PO ₄)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	TEMP- ERATURE (DEG C)
10...	23	.2		.21	2.5	.21	1.1	634	479	263	938	8.0	13
13...	14	.2		.02	2.9	.00	.25	371	306	96	604	8.2	7
DEC.													
13...	12	.1		.03	4.1	.11	.21	301	261	78	507	7.9	3
JAN.													
15...	18	.1		.03	4.6	1.2	.78	535	429	190	826	7.8	0
FEB.													
C2...	16	.2		.04	3.5	.16	.16	300	249	80	516	7.8	0
16...	19	.2		.04	4.8	.12	.59	530	431	191	818	7.8	0
APR.													
01...	22	.1		.05	3.7	.19	.77	562	446	213	869	7.9	0
20...	12	.1		.02	3.8	.09	.13	255	219	66	438	7.8	3
MAY													
03...	15	.1		.01	3.4	.19	.32	362	306	100	612	7.7	9
18...	18	.2		.04	1.5	.00	.60	467	389	175	729	8.0	12
JUNE													
01...	21	.3		.07	1.6	.14	.47	487	399	185	754	8.0	--
22...	16	.1		.09	1.7	.10	.73	425	351	133	671	8.0	13
JULY													
16...	23	.2		.30	1.5	.13	1.2	490	386	174	770	8.1	16
26...	8.0	.0		.05	4.5	--	.16	228	196	49	397	7.7	18
JULY													
30...	26	.3		.22	1.5	.23	1.0	521	411	205	809	7.7	19

04243700 CANASERAGA CREEK NEAR LAKEPORT, N.Y.

LOCATION.--Lat 43°05'53", long 75°51'04", Madison County, at bridge on Tag Road, 900 ft downstream from New York State Thruway and 3.4 miles southeast of Lakeport.

DRAINAGE AREA.--20.1 sq mi, not including 2.15 sq mi diverted to Erie (Barge) Canal.

PERIOD OF RECORD.--Chemical analyses: July 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE DEC.	TIME	DIS- CHARGE (CFS)	SILICA [SiO ₂]	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH ₄)	BICAR- BONATE (HCO ₃)	CAR- BONATE (CO ₃)	SULFATE (SO ₄)
13...	1100	12	4.5	99	21	2.2	9.0	2.4	.02	241	0	126
JAN.												
18...	1315	19	4.8	180	36	4.7	9.4	2.2	.00	297	0	331
FEB.												
01...	0830	108	4.1	90	19	2.0	7.2	2.2	.02	212	0	115
16...	1530	65	4.6	166	34	3.8	7.6	1.7	.00	286	0	316
29...	1000	69	4.4	172	34	4.3	9.9	1.7	.08	268	0	328
MAR.												
19...	1000	116	3.7	80	17	1.8	6.8	2.0	--	192	0	105
APR.												
02...	0945	55	3.6	125	25	3.1	7.0	1.7	.00	265	0	189
16...	1220	130	3.6	162	32	3.8	7.8	1.7	.10	259	0	290
MAY												
01...	1500	29	3.1	152	32	4.0	8.0	1.9	.06	262	0	284
22...	0830	34	3.8	139	29	3.3	9.6	1.7	.15	280	0	233
JUNE												
05...	1340	15	2.9	154	32	4.1	9.0	1.7	.14	271	0	286
28...	1200	221	5.2	71	14	1.4	5.2	2.5	--	200	0	68
JULY												
30...	0650	28	4.7	176	34	5.6	8.4	2.3	.18	262	0	399

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04243700 CANASERAGA CREEK NEAR LAKEPORT, N.Y.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC. 13...	18	.2	.04	3.4	.09	.30	404	334	136	656	8.2	10
JAN. 18...	22	.1	.02	6.0	.60	.41	746	597	354	1060	8.0	0
FEB. 01...	17	.2	.02	3.7	.01	.17	365	303	129	586	7.9	0
16...	17	.2	.01	3.6	.12	.16	696	554	320	1000	8.0	0
25...	21	.1	.01	5.1	.09	.05	713	569	350	1040	7.9	0
MAR. 15...	15	.1	.03	3.8	---	.06	329	270	112	540	7.8	2
APR. 03...	16	.2	.00	4.2	.08	.13	505	415	198	786	8.0	---
16...	17	.2	.00	1.8	.05	.11	647	536	324	932	7.9	10
MAY 01...	18	.3	.01	3.6	.05	.02	636	511	296	920	8.2	9
22...	18	.1	.02	1.9	.25	.05	578	466	236	860	8.0	11
JUNE 05...	18	.2	.03	.2	.06	.14	643	516	294	954	7.9	16
28...	9.6	.0	.05	6.0	---	.13	281	235	70	476	7.7	14
JULY 30...	18	.3	.02	2.2	.00	.11	720	579	365	1060	7.8	16

04243800 COWASELON CREEK AT ONIONTOWN, N.Y.

LOCATION.--Lat 43°07'02", long 75°49'51", Madison County, at bridge on Gees road, in Oniontown, 1.5 miles north of New York State Thruway and 2.7 miles southeast of Lakeport.

DRAINAGE AREA.--69.2 sq mi, not including 0.81 sq mi diverted to Erie (Barge) Canal.

PERIOD OF RECORD.--Chemical analyses: March 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	OIS-CHARGE (CFS)	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NAI)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)
DEC. 13...	1200	267	4.7	104	23	2.1	13	2.5	.27	223	0	163
JAN. 18...	1645	51	5.5	196	39	4.6	31	2.4	.34	299	0	378
FEB. 01...	1000	421	4.5	96	22	1.9	12	2.7	.14	209	0	142
14...	1400	---	5.4	184	36	4.1	14	2.5	.07	302	0	346
29...	1100	30	5.3	190	35	4.1	17	1.9	.24	283	0	385
MAR. 19...	0800	313	4.0	82	18	1.7	11	2.3	.36	180	0	127
APR. 03...	1045	143	4.3	141	28	3.2	12	1.9	.14	271	0	242
16...	1300	74	4.2	176	34	3.6	15	2.0	.36	285	0	338
MAY 23...	1115	73	3.3	162	33	3.4	14	2.1	.08	276	0	303
JUNE 05...	1430	52	3.7	167	34	4.0	20	2.6	.12	284	0	326
29...	1330	1020	4.6	68	13	1.2	8.9	2.6	---	172	0	76
JULY 30...	0730	35	5.8	187	39	5.0	25	2.6	.27	272	0	386

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC. 13...	27	.2	.09	5.7	.24	.23	354	172	456	8.0	4
JAN. 18...	59	.2	.05	4.7	.86	.55	650	405	1230	8.2	0
FEB. 01...	26	.2	.04	4.9	.02	.43	330	159	667	7.6	1
14...	25	.2	.04	4.6	.03	.89	607	360	1120	7.4	0
29...	31	.1	.02	3.4	.05	.20	618	386	1160	7.8	0
MAR. 19...	21	.2	.04	4.3	.06	.16	279	131	594	7.5	2
APR. 03...	24	.2	.03	4.3	.21	.34	467	245	898	7.9	8
16...	25	.2	.02	1.9	.06	.66	579	346	1050	7.8	12
MAY 23...	31	.2	.05	2.4	.23	.18	540	314	1000	8.0	16
JUNE 05...	31	.2	.09	1.8	.11	.57	557	324	1060	7.7	21
29...	12	.1	.07	7.1	---	.28	223	82	478	7.7	14
JULY 30...	41	.3	.23	2.6	.31	.62	628	404	1180	7.5	16

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04243880 CHITTENANGO CREEK AT RIPPLETON, N.Y.

LOCATION.--Lat 42°54'41", long 72°52'03", Madison County, at bridge on Rippleton-Cross Road in Rippleton, 0.1 mile southwest of State Highway 13, 0.6 mile south of Cazenovia and 1.1 miles south of U.S. Highway 20.

DRAINAGE AREA.--31.8 sq mi.

PERIOD OF RECORD.--Chemical analyses: December 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO JULY 1968												
DATE	TIME	DIS- CHARGE (CFS)	SILICA (SiO ₂)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH ₄)	BICAR- BONATE (HCO ₃)	CAR- BONATE (CO ₃)	SULFATE (SO ₄)
DEC.												
12...	1545	241	3.3	41	7.4	.03	4.5	1.2	.02	142	0	15
JAN.												
18...	1115	25	4.3	54	10	.08	3.8	.9	.00	706	0	20
31...	1500	92	3.8	46	8.8	.07	4.4	1.1	.04	157	0	17
FEB.												
16...	0910	39	3.8	51	10	.10	3.7	.9	.00	174	0	17
28...	1340	21	4.1	55	11	.12	3.9	.7	.09	194	0	22
MAR.												
19...	1145	125	3.4	41	8.0	.09	3.8	1.2	.02	134	0	22
APR.												
04...	1130	88	3.3	46	9.2	.09	3.1	.9	.01	162	0	16
15...	1215	40	2.0	53	9.1	.09	3.3	.9	.14	183	0	16
MAY												
01...	1700	37	2.3	50	10	.10	3.4	.9	.01	179	0	16
21...	1330	57	2.8	46	9.0	.02	3.8	.8	.05	163	0	15
JUNE												
06...	1245	30	.8	46	8.9	.00	3.4	.9	.00	166	0	14
27...	1515	19	3.6	39	6.9	.02	2.7	1.0	--	134	0	13
JULY												
30...	1745	11	2.4	56	13	.08	4.0	1.0	.07	210	0	15

DATE	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRITE (NO ₂)	NITRATE (NO ₃)	ORGANIC NITRO- GEN (N)	TOTAL PHOS- PHORUS (PO ₄)	DIS- SOLVED SOLIDS SUM OF CONSTI- TUENTS	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC CORN- STANCE (MICP- MMS)	PH	TEMP- ERATURE (DEG C)
DEC.												
12...	8.8	.1	.01	1.4	2.2	.07	153	133	16	781	8.0	?
JAN.												
18...	7.0	.1	.02	3.0	.18	.16	204	176	6	369	8.0	0
31...	9.8	.1	.02	2.0	.05	.17	170	151	22	305	7.9	0
FEB.												
16...	7.1	.1	.02	2.2	.08	.03	182	168	24	330	8.0	0
28...	7.9	.0	.00	3.0	.32	.04	203	182	23	357	7.9	0
MAR.												
19...	7.8	.1	.01	2.4	.00	.04	156	135	25	270	7.8	0
APR.												
04...	6.6	.1	.01	1.8	.10	.10	167	153	20	308	7.9	8
15...	6.9	.1	.00	1.5	.04	.02	183	170	20	331	8.2	10
MAY												
01...	7.0	.2	.00	1.4	.06	.10	179	166	20	323	8.2	9
21...	6.2	.1	.01	1.0	.13	.05	165	152	18	290	8.0	12
JUNE												
06...	5.9	.1	.00	.7	.00	.17	163	152	16	297	8.1	20
27...	4.3	.0	.01	2.0	--	--	139	126	16	252	7.9	14
JULY												
30...	7.7	.3	.00	.9	.08	.04	203	193	21	370	8.1	21

04244990 WEST BRANCH LIMESTONE CREEK NEAR MANLIUS, N.Y.

LOCATION.--Lat 42°58'51", long 75°58'52", Onondaga County, at bridge on Broadfield Road, 0.6 mile northeast of road between Manlius and Waterville and 1.1 miles south of Manlius.

PERIOD OF RECORD.--Chemical analyses: December 1967 to July 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO JULY 1968												
DATE	TIME	DIS- CHARGE (CFS)	SILICA (SiO ₂)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH ₄)	BICAR- BONATE (HCO ₃)	CAR- BONATE (CO ₃)	SULFATE (SO ₄)
DEC.												
12...	1420	120	3.9	64	11	.02	4.0	1.4	.01	215	0	24
JAN.												
18...	0900	12	4.5	78	14	.15	3.4	.8	.00	256	0	26
31...	1145	74	4.1	66	12	.12	3.8	1.2	.02	216	0	25
FEB.												
15...	--	18	4.2	72	13	.17	3.3	.8	.00	235	0	28
28...	1150	11	4.6	72	13	.16	3.4	.7	.19	244	0	31
MAR.												
19...	1400	128	3.6	55	9.7	.11	3.3	1.1	.02	176	0	29
APR.												
04...	1030	90	3.4	61	10	.15	3.4	1.1	.10	201	0	22
15...	1200	20	2.7	66	11	.14	3.3	.9	.01	208	5	23
30...	1440	15	2.3	65	12	.17	3.2	1.0	.14	217	0	23
MAY												
21...	1500	20	3.2	68	12	.10	3.9	.9	.01	229	0	23
JUNE												
06...	1145	10	1.8	63	12	.15	3.6	.9	.06	223	0	22
27...	1620	140	5.3	66	10	.10	3.2	1.3	--	219	0	20
JULY												
30...	1625	29	4.5	58	12	.12	4.0	1.1	.07	202	0	20

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04244990 WEST BRANCH LIMESTONE CREEK NEAR MANLIUS, N.Y.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO JULY 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC. 12...	9.8	.1	.04	2.7	2.5	.23	227	205	28	404	8.2	3
JAN. 18...	8.3	.1	.01	3.0	.00	.40	265	252	42	456	8.2	0
31...	10	.1	.02	3.9	.15	.02	232	214	37	406	8.2	1
FEB. 15...	9.0	.1	.01	3.3	.00	.04	250	233	40	434	8.0	0
28...	9.3	.0	.00	2.9	.02	.00	257	233	33	445	8.1	0
MAR. 19...	8.8	.1	.01	2.6	1.9	.04	199	177	33	342	8.0	4
APR. 04...	9.2	.2	.01	2.7	.00	.22	212	193	28	380	8.1	8
15...	9.0	.1	.00	1.6	.07	.00	224	210	31	395	8.4	10
30...	8.8	.1	.00	1.6	.02	.04	224	212	34	396	8.2	10
MAY 21...	8.5	.1	.00	.5	.20	.05	233	219	32	398	8.2	13
JUNE 06...	8.0	.2	.00	.8	.07	.10	223	207	24	400	8.0	21
27...	7.0	.0	.01	5.2	--	.09	226	206	26	399	8.1	14
JULY 30...	9.9	.2	.00	1.1	.00	.01	210	194	28	369	8.0	25

04245200 BUTTERNUT CREEK NEAR JAMESVILLE, N.Y.

LOCATION.--Lat 42°55'49", long 76°03'52", Onondaga County, at highway bridge on county road, 0.2 mile upstream from Stebbins Gulf tributary, 0.3 mile upstream from gaging station, 2.5 miles upstream from Jamesville Reservoir, and 4 miles south of Jamesville.

DRAINAGE AREA (revised).--32.2 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1966 to July 1968 (discontinued).
Water temperatures: July 1966 to June 1967.

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SiO2)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	PJ-TAS-SIUM (K)	AMMONIA (NH4)	BICARBONATE (HC03)	CARBONATE (CO3)	SULFATE (SO4)
DEC. 12...	1235	143	4.8	70	15	.10	4.8	1.2	.00	240	0	23
JAN. 17...	1030	30	5.4	83	13	.23	4.8	1.0	.00	276	0	29
31...	0950	102	4.5	63	14	.16	4.9	1.1	.01	225	0	25
FEB. 15...	1100	40	4.5	75	17	.26	5.2	.9	.02	264	0	30
28...	1020	28	2.4	42	17	.57	5.3	1.0	.12	107	0	51
MAR. 19...	1515	182	4.1	58	11	.20	3.9	1.2	.07	194	0	28
APR. 04...	1000	90	3.9	65	13	.24	4.3	1.0	.09	228	0	25
15...	1540	46	3.5	70	15	.22	4.5	1.0	.05	238	6	26
30...	1600	39	2.9	70	17	.26	4.6	1.0	.05	252	0	27
MAY 23...	1635	40	2.1	62	16	.24	4.8	.9	.00	235	0	23
JUN. 06...	1000	29	2.4	64	16	.25	4.6	.9	.00	244	0	24
27...	1725	160	5.6	63	12	.15	3.5	1.2	.13	226	0	19
JULY 30...	1325	14	4.5	62	17	.25	5.5	1.2	.13	242	0	24

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
DEC. 12...	9.2	.1	.07	3.8	2.2	.14	236	40	439	8.1	2
JAN. 17...	8.8	.1	.02	5.8	.00	.19	285	59	497	8.1	0
31...	10	.2	.07	3.5	.01	.00	215	30	419	8.1	0
FEB. 15...	9.8	.1	.00	5.3	.00	.06	257	40	481	8.0	0
28...	10	.1	.00	1.0	.11	.08	175	88	309	7.9	0
MAR. 19...	8.4	.1	.01	2.4	1.4	.04	190	30	366	7.8	6
APR. 04...	3.8	.1	.00	3.4	.02	.50	216	28	424	8.0	7
15...	9.3	.1	.00	1.6	.02	.06	236	31	444	8.3	10
30...	7.0	.1	.00	3.0	.07	.02	245	38	453	8.2	10
MAY 23...	9.9	.1	.01	1.5	.17	.10	221	38	418	8.1	14
JUNE 06...	8.0	.2	.00	1.5	.17	.08	226	26	430	8.1	18
27...	6.0	.0	.01	2.9	.39	.19	207	22	398	8.0	14
JULY 30...	9.2	.3	.00	1.6	.00	.02	225	26	434	7.9	21

STREAMS TRIBUTARY TO LAKE ONTARIO

04245500 CHITTENANGO CREEK AT BRIDGEPORT, N.Y.

LOCATION,--Lat 43°09'17", long 75°58'19", Madison County, at bridge on State Highway 31, in Bridgeport.

DRAINAGE AREA,--282 sq mi.

PERIOD OF RECORD,--Chemical analyses: March 1967 to July 1968 (discontinued).

Water temperatures: April 1967 to September 1968.

EXTREMES,--1967-68:

Water temperatures: Maximum, 27.0°C June 13, 1967; minimum, freezing point on many days during December to February.

REMARKS,--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DIS-CHARGE (CFS)	SILICA (SD2)	CALCIUM (CA)	MAGNE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)
OCT.												
09...	1610	226	4.1	125	21	2.2	13	2.2	.00	250	0	178
NOV.												
13...	1300	120	5.1	86	17	1.2	10	1.8	.22	238	0	94
DEC.												
12...	1815	860	4.2	86	17	1.1	11	1.5	.08	215	0	95
JAN.												
17...	1715	276	4.7	110	24	1.8	9.8	1.4	.01	250	0	153
FEB.												
02...	0745	--	4.3	73	15	.81	9.0	1.8	.23	194	0	70
14...	1630	405	4.3	100	22	1.8	11	1.7	.01	252	0	149
29...	0820	262	4.1	116	22	1.9	12	1.5	.28	242	0	169
MAR.												
18...	1745	1520	3.4	57	11	.58	7.4	2.1	1.6	152	0	60
APR.												
03...	0745	917	2.3	79	15	1.0	7.4	1.4	.11	196	0	88
10...	0920	375	2.3	108	20	1.6	9.3	1.6	.04	233	0	142
MAY												
01...	1540	297	1.4	116	22	1.9	12	1.8	.14	241	0	166
23...	1000	401	.3	98	18	1.3	9.3	1.4	.17	236	0	114
JUNE												
05...	1600	286	3.2	96	19	1.3	10	1.5	.18	232	0	121
28...	0930	1970	4.6	52	10	.54	5.6	2.1	--	152	0	46
JULY												
31...	1235	176	3.8	134	25	2.8	13	2.2	.05	237	0	230

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	TEMPERATURE (DEG C)
OCT.												
05...	23	.2	.09	2.3	.02	.36	494	399	194	775	8.0	13
NOV.												
13...	18	.3	.02	2.2	.00	.16	353	285	90	580	8.1	8
DEC.												
12...	21	.1	.04	2.4	.12	.27	346	285	108	575	8.1	1
JAN.												
17...	21	.1	.02	4.0	.00	.58	453	373	168	716	8.0	0
FEB.												
02...	18	.2	.02	2.5	.10	.08	290	244	84	490	7.8	0
14...	22	.2	.02	3.4	.10	.34	440	340	134	714	7.8	0
29...	23	.1	.06	2.7	.25	.31	472	380	182	747	7.8	0
MAR.												
18...	14	.1	.04	2.5	.60	.23	235	187	62	403	7.6	1
APR.												
03...	16	.1	.01	1.7	.12	.35	308	259	98	511	8.0	8
16...	21	.2	.02	1.4	.26	.14	422	352	161	668	7.8	12
MAY												
01...	24	.3	.05	1.9	.10	.32	466	380	183	726	8.0	11
23...	18	.1	.04	1.9	.25	.31	382	319	125	618	7.9	13
JUNE												
05...	19	.3	.09	1.6	.10	.53	388	318	128	637	7.7	17
28...	10	.1	.03	1.7	--	.20	208	171	46	357	7.5	14
JULY												
31...	28	.3	.10	1.8	.00	.42	557	438	244	846	7.7	20

TEMPERATURE (°C) OF WATER, APRIL TO SEPTEMBER 1968

MONTH	DAY																															AVER-AGE
	1	2	3	4	5	6	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.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	9	7	8	8	9	8	7	7	8	6	11	11	--	--
MAY.....	13	14	13	11	10	11	9	8	6	7	7	8	11	12	11	11	12	13	13	13	12	11	12	12	14	15	14	15	14	16	15	12
JUNE.....	18	18	21	22	22	23	22	21	22	23	23	25	27	29	26	26	24	23	23	24	23	24	24	24	24	23	23	24	22	22	--	23
JULY.....	23	24	22	22	20	22	23	22	22	24	24	23	22	21	20	19	22	21	22	21	22	23	22	22	22	21	21	24	23	22	23	22
AUGUST....	23	24	23	22	21	21	21	21	20	20	19	19	19	22	22	22	21	22	21	21	19	19	19	19	19	20	20	18	20	18	20	20
SEPTEMBER	17	16	16	17	18	19	20	21	19	17	15	14	15	16	17	18	18	19	19	21	19	18	15	13	12	13	14	15	16	15	--	17

04245500 CHITTENANGO CREEK AT BRIDGEPORT, N.Y.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

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

04245840 SCRIBA CREEK NEAR CONSTANTIA, N.Y.

LOCATION.--Lat 43°15'35", long 76°00'11", Oswego County, at gaging station at bridge on road to Ingersoll Cemetery and about 0.8 mile north of Constantia.

DRAINAGE AREA.--38.4 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1966 to July 1968 (discontinued).

Water temperatures: July 1966 to April 1967.

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	TIME	DISE- CHARGE (CF5)	SILICA (SI02)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- SIUM (K)	AMMONIA (NH4)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	
OCT.	09...	--	16	6.0	16	4.4	2.0	.4	.00	57	0	8.3	
NOV.	14...	1520	218	3.7	6.6	2.2	.01	1.3	.2	.01	16	9.5	
DEC.	18...	1315	86	3.7	7.8	2.8	.00	1.6	.3	.00	21	11	
JAN.	16...	1415	52	4.8	9.1	3.9	.01	1.6	.4	.00	30	14	
FEB.	01...	--	150	4.1	6.8	2.5	.02	1.7	.2	.08	20	11	
	14...	--	54	4.4	8.5	3.2	.04	1.5	.4	.00	28	0	
	29...	--	43	5.0	8.8	3.1	.06	1.6	.3	.07	30	0	
MAR.	20...	1025	301	3.2	5.9	2.0	.05	1.2	.4	.01	15	12	
APR.	02...	1500	324	2.0	4.8	1.6	.04	.8	.3	.00	11	9.8	
	16...	0850	54	2.1	8.6	3.0	.05	1.5	.6	.03	28	9.0	
MAY	01...	0840	59	2.0	8.3	2.7	.06	1.3	.4	.08	29	7.8	
	22...	1630	92	2.0	8.2	2.4	.00	1.2	.3	.00	26	5.0	
JUNE	04...	1430	41	2.6	9.0	3.0	.03	1.4	.4	.09	32	4.2	
JULY	30...	1315	15	3.5	12	4.2	.00	1.9	.5	.06	47	7.1	
DATE	CHLOR- IDE (CL)	FLUOR- IDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO- GEN (N)	TOTAL PHOS- PHORUS (P04)	SOLIDS (SUM OF CONSTITU- ENTS)	HARD- NESS (CA,MG)	NON- CAR- BONATE HARD- NESS	SPECTI- FIC COND- UCTANCE (MICRO- MHOS)	PH	TEMP- ERATURE (DEG C)	
OCT.	09...	1.5	.2	.00	.8	.07	.18	66	58	12	127	7.7	12
NOV.	14...	.9	.3	.00	1.2	.00	.05	34	26	12	58	7.0	2
DEC.	18...	2.1	.2	.01	.9	.18	.14	40	31	14	67	7.1	2
JAN.	16...	2.3	.1	.00	1.1	.00	.21	52	38	.4	80	7.1	0
FEB.	01...	3.5	.1	.01	1.1	.23	.00	40	27	11	65	6.9	0
	14...	3.5	.1	.00	.9	.15	.11	49	34	11	79	7.1	0
	29...	3.2	.1	.00	.9	.06	.00	53	35	10	80	7.3	0
MAR.	20...	4.0	.1	.01	1.1	.00	.07	37	22	10	54	6.8	1
APR.	02...	1.8	.1	.01	.6	.14	.22	27	18	10	45	6.7	6
	16...	3.9	.2	.00	.8	.21	.03	44	34	11	72	7.1	9
MAY	01...	2.2	.2	.01	.8	.12	.02	40	32	8	71	7.2	10
	22...	1.9	.1	.00	1.1	.16	.02	35	30	9	61	7.1	14
JUNE	04...	1.5	.2	.01	1.1	.13	.08	40	35	9	71	7.1	17
JULY	30...	3.0	.2	.00	1.1	.14	.00	56	47	8	107	7	18

04245932 ONEIDA LAKE, USGS STATION NO. 11, N.Y.

LOCATION.--Lat 43°09'50", long 75°51'40", Oneida County, at U.S. Geological Survey buoy No. 11.

PERIOD OF RECORD.--Chemical analyses: June 1967 to August 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office in Albany, N.Y. All samples filtered with 0.45 micron pressure filter at time of collection. Additional determinations and observations of biologic parameters of water and bed material at this sampling site on file in district office. Biological samples include phytoplankton concentrations, plant pigments (i.e., chlorophylls a and b), total seston, and Secchi disc readings.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO AUGUST 1968

DATE OCT.	TIME	DEPTH (FT)	TEMP-ERATURE (DEG C)	DISS-OLVED OXYGEN	SILICA (SiO2)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)
09...	1225	0	16	10.0	--	--	--	--	--	--	--	--
MAY												
09...	0915	0	11	12.0	.5	40	8.5	.57	4.4	1.1	.00	101
AUG.												
20...	1015	0	22	8.4	--	--	--	--	--	--	--	--

DATE OCT.	SULFATE (SO4)	CHLU-RIDE (CL)	FLUO-RIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO-GEN (N)	TOTAL PHOS-PHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	HARD-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SPECI-FIC CON-DUCTANCE (MICRO-MHOS)	PH
09...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
09...	50	9.9	.2	.03	.0	.02	.04	165	135	52	288	8.1
AUG.												
20...	--	--	--	--	--	--	--	--	--	--	--	--

04245934 ONEIDA LAKE, USGS STATION NO. 12, N.Y.

LOCATION.--Lat 43°11'40", long 75°51'10", Oneida County, at New York State Barge Canal system buoy 117-FIW.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office in Albany, N.Y. All samples filtered with 0.45 micron pressure filter at time of collection. Additional determinations and observations of biologic parameters of water and bed material at this sampling site on file in district office. Biological samples include phytoplankton concentrations, plant pigments (i.e., chlorophylls a and b), total seston, and Secchi disc readings.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OCT.	TIME	DEPTH (FT)	TEMP-ERATURE (DEG C)	DISS-OLVED OXYGEN	SILICA (SiO2)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)
09...	1315	0	16	9.8	.9	43	10	.61	5.4	.8	.00	108
09...	1316	10	16	9.8	--	--	--	--	--	--	--	--
09...	1317	20	16	9.8	--	--	--	--	--	--	--	--
09...	1318	30	16	9.7	--	--	--	--	--	--	--	--
09...	1319	40	16	9.5	--	--	--	--	--	--	--	--
30...	1245	0	11	10.2	.3	40	8.9	--	5.4	1.0	.00	108
30...	1246	10	11	10.2	--	--	--	--	--	--	--	--
30...	1247	20	11	10.0	--	--	--	--	--	--	--	--
30...	1248	30	11	10.0	--	--	--	--	--	--	--	--
30...	1249	42	11	9.8	--	--	--	--	--	--	--	--
FEB.												
27...	1145	0	0	14.6	3.9	33	8.5	.38	5.0	1.0	.37	92
27...	1146	30	0	10.4	2.7	45	10	.62	5.6	1.1	.06	113
APR.												
18...	0930	0	8	13.8	1.9	38	7.4	.48	4.5	1.0	.00	96
18...	0931	10	8	--	--	--	--	--	--	--	--	--
18...	0932	20	8	--	--	--	--	--	--	--	--	--
18...	0933	40	7	14.0	2.1	37	7.4	.48	4.7	.9	.01	94
MAY												
09...	1150	0	11	12.2	.6	39	8.3	.53	4.2	1.0	.00	97
09...	1151	10	10	12.4	--	--	--	--	--	--	--	--
09...	1152	20	10	12.3	--	--	--	--	--	--	--	--
09...	1153	30	10	11.7	--	--	--	--	--	--	--	--
09...	1154	40	10	11.3	--	--	--	--	--	--	--	--
JUNE												
05...	0945	0	16	11.2	1.0	38	8.5	.53	4.5	1.0	.11	99
05...	0946	10	15	11.2	--	--	--	--	--	--	--	--
05...	0947	20	15	11.5	--	--	--	--	--	--	--	--
05...	0948	30	14	10.3	--	--	--	--	--	--	--	--
05...	0949	40	13	8.0	2.6	38	8.4	.55	4.5	1.0	.05	101
14...	0950	0	19	10.4	--	--	--	--	--	--	--	--
14...	0951	10	18	10.6	--	--	--	--	--	--	--	--
14...	0952	20	18	10.0	--	--	--	--	--	--	--	--
14...	0953	30	18	9.8	--	--	--	--	--	--	--	--
14...	0954	40	16	6.0	--	--	--	--	--	--	--	--
JULY												
03...	0730	0	20	8.2	2.8	38	8.4	.52	4.6	1.0	.06	100
03...	0731	10	20	8.1	--	--	--	--	--	--	--	--
03...	0732	20	19	8.0	--	--	--	--	--	--	--	--
03...	0733	30	18	6.2	--	--	--	--	--	--	--	--
03...	0734	40	16	4.5	4.2	32	7.2	.36	3.7	1.0	.26	88
10...	0730	0	22	9.2	--	--	--	--	--	--	--	--
10...	0731	10	22	9.3	--	--	--	--	--	--	--	--
10...	0732	20	21	9.1	--	--	--	--	--	--	--	--
10...	0733	30	18	6.5	--	--	--	--	--	--	--	--
10...	0734	40	17	4.4	--	--	--	--	--	--	--	--
17...	1020	0	26	13.3	.9	39	8.3	.55	4.8	1.0	.05	102
17...	1023	10	26	13.9	--	--	--	--	--	--	--	--
17...	1026	20	23	11.2	--	--	--	--	--	--	--	--
17...	1029	30	22	7.0	--	--	--	--	--	--	--	--
17...	1031	40	20	6.1	5.0	39	8.4	.55	4.5	1.1	.00	100
24...	0900	0	25	10.1	--	--	--	--	--	--	--	--
31...	0830	0	22	9.4	2.3	41	9.0	.45	4.7	1.1	.03	106
31...	0831	10	22	8.5	--	--	--	--	--	--	--	--
31...	0832	20	22	8.5	--	--	--	--	--	--	--	--
31...	0833	30	22	8.4	--	--	--	--	--	--	--	--
31...	0834	40	21	4.1	4.6	41	8.8	.54	4.6	1.0	.26	106

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	HARDNESS (CA,MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
OCT.												
09...	53	9.2	.1	.00	.3	.03	.33	177	148	59	308	7.9
09...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
30...	53	9.7	.0	.00	.2	.01	.71	172	137	48	311	7.8
30...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
FEB.												
27...	37	9.8	.0	.00	1.5	.07	.03	145	118	42	260	7.4
27...	55	11	.1	.02	1.0	.15	.22	188	153	60	330	7.6
APR.												
18...	46	9.8	.1	.00	.6	.18	.05	157	126	47	274	7.6
18...	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--
18...	46	9.3	.1	.00	--	--	--	--	--	--	273	7.7
MAY												
09...	47	9.0	.2	.03	.2	.14	.00	158	132	52	277	8.1
09...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
05...	49	9.0	.2	.01	.6	.06	--	162	1300	49	284	7.9
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	48	8.8	.1	.01	.5	.04	.13	163	130	46	288	7.7
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
03...	48	9.1	.0	.00	.2	.17	.20	162	130	48	286	7.7
03...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
03...	35	7.6	.0	.01	1.4	.30	.24	136	110	38	238	7.5
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	45	9.3	.1	.00	.1	.56	.22	159	132	48	288	8.0
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	45	9.3	.1	.01	.1	.38	.32	162	132	50	281	7.3
24...	--	--	--	--	--	--	--	--	--	--	--	--
31...	48	9.5	.2	.00	.6	.00	.07	169	139	52	290	7.7
31...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
31...	48	9.7	.3	.02	.3	.11	.13	171	138	51	291	7.3
AUG.												
06...	1640	0	23	10.0	2.8	41	9.0	.54	4.8	1.1	.06	105
06...	1645	10	23	10.4	--	--	--	--	--	--	--	--
06...	1650	20	22	10.0	--	--	--	--	--	--	--	--
06...	1655	30	22	9.1	--	--	--	--	--	--	--	--
06...	1700	40	22	4.2	5.5	41	8.9	.56	5.0	1.1	.17	106
20...	0935	0	22	9.0	4.3	40	8.6	.55	4.7	1.2	.12	104
20...	0936	10	19	8.8	--	--	--	--	--	--	--	--
20...	0937	20	18	8.7	--	--	--	--	--	--	--	--
20...	0938	30	19	8.4	--	--	--	--	--	--	--	--
20...	0939	40	20	7.9	4.4	40	8.6	.56	4.7	1.1	.12	106
28...	1000	0	22	11.0	--	--	--	--	--	--	--	--
28...	1001	10	22	10.6	--	--	--	--	--	--	--	--
28...	1002	20	22	10.3	--	--	--	--	--	--	--	--
28...	1003	30	22	10.0	--	--	--	--	--	--	--	--
28...	1004	40	22	10.0	--	--	--	--	--	--	--	--
SEPT.												
24...	1240	0	22	12.0	--	--	--	--	--	--	--	--
24...	1241	10	21	10.8	--	--	--	--	--	--	--	--
24...	1242	20	20	9.8	--	--	--	--	--	--	--	--
24...	1243	30	20	7.4	--	--	--	--	--	--	--	--
24...	1244	40	19	6.0	--	--	--	--	--	--	--	--

DATE	TIME	DEPTH (FT)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)
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STREAMS TRIBUTARY TO LAKE ONTARIO

04245934 ONEIDA LAKE, USGS STATION NO. 12, N.Y.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROHMS)	PH
AUG. 06...	49	9.4	.2	.00	.4	.16	.11	170	139	53	295	7.5
06...	--	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--	--
06...	49	9.6	.2	.00	.4	.08	.23	174	139	52	294	7.7
20...	50	9.1	.1	.00	.4	.08	.24	170	136	50	291	7.5
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	49	8.9	.1	.00	.5	.04	.22	170	136	48	291	7.6
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
SEPT. 24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--

SPECTROGRAPHIC ANALYSES, MICROGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OF COLLECTION	ALUMINUM (AL)	BARIUM (BA)	BERYLLIUM (BE)	BISMUTH (BI)	BORON (B)	CADMIUM (CD)	CHROMIUM (CR)	COPPER (CU)	COPPER (CU)	GALLIUM (GA)	GERMANIUM (GE)	IRON (FE)	LEAD (PB)
OCT. 9, 1967	100	40	<.2	<3	25	<2	50	<2	6	<2	ND	260	3
OCT. 30	8	40	<.2	<3	24	<2	1	<2	3	<2	ND	4	8
FEB. 27, 1968	25	31	<.7	ND	23	ND	8	<5	30	ND	ND	85	20
APR. 18	20	29	<2	ND	17	ND	3	<5	5	ND	ND	21	<3
MAY 5	12	33	<.8	<2	17	<16	2	<8	8	ND	<4	7	<4
MAY 9	25	31	<2	ND	18	ND	5	<5	4	ND	ND	17	3
JUNE 14	17	34	<.8	<2	17	<16	3	<8	6	--	<4	8	<4
JULY 3	16	32	<.8	<2	32	<17	2	<8	6	--	<4	12	7
JULY 10	24	36	<.8	<2	17	<17	2	<8	8	--	<4	18	<4
JULY 24	9	33	<.8	ND	18	ND	<4	<8	12	--	ND	4	<4
JULY 31	13	25	<.8	ND	17	ND	<4	<8	7	--	ND	9	<4
AUG. 6	12	29	<.8	<2	20	<16	2	<8	5	--	ND	9	9
AUG. 20	9	29	<.8	<2	19	<16	<2	<8	5	--	ND	4	8
AUG. 20B	8	31	<.8	<2	26	<16	<2	<8	25	--	ND	4	20
AUG. 28	6	27	<.6	<3	27	<30	<3	<3	<4	--	ND	9	<3
SEP. 12	22	31	<.8	<4	28	<40	6	<4	5	--	ND	33	<4
SEP. 24	16	35	<2	<8	32	<16	<6	<8	16	--	<8	24	<4
DATE OF COLLECTION	LITHIUM (LI)	MANGANESE (MN)	MOLYBDENUM (MO)	NICKEL (NI)	RUBIDIUM (RB)	SILVER (AG)	STRONTIUM (SR)	TIN (SN)	TITANIUM (TI)	VANADIUM (V)	ZINC (ZN)	ZIRCONIUM (ZR)	
OCT. 9, 1967	3	5	<.6	2	.9	<.2	580	<3	8	<3	10	ND	
OCT. 30	4	2	<.6	<.6	1	<.2	660	<3	<2	<3	15	ND	
FEB. 27, 1968	3	40	<.5	4	.9	<.4	350	<5	<2	<2	ND	ND	
APR. 18	3	7	<.1	<.4	.8	<.4	420	<5	<3	<4	<200	ND	
MAY 5	3	7	<.8	<.5	.6	<.4	510	<5	2	<4	<160	--	
MAY 9	2	4	<.1	<.4	<.5	<.4	520	<5	<3	<4	<200	ND	
JUNE 14	3	4	<.8	<.5	.7	<.4	580	<5	2	<4	<160	--	
JULY 3	4	1	<.8	<.6	.9	<.4	550	<6	2	<4	<170	--	
JULY 10	4	4	<.8	<.6	1	<.4	590	<6	3	<4	<170	--	
JULY 24	3	2	<.2	<.4	.8	<.4	570	<8	<2	<4	<160	--	
JULY 31	3	5	<.2	<.4	.7	<.4	580	<8	<2	<4	<160	--	
AUG. 6	4	3	<.8	<.4	1	<.4	560	<5	<2	<4	<160	--	
AUG. 20	3	<.1	<.8	<.4	.8	<.4	550	<5	<2	<4	<160	--	
AUG. 20B	4	<.1	<.8	<.4	.8	<.4	600	<5	<2	<4	<160	--	
AUG. 28	2	<.3	<.6	<.3	.5	<.3	560	<6	<3	<3	ND	--	
SEP. 12	4	<.4	<.8	<.4	.8	<.4	560	<8	<.4	<.4	ND	--	
SEP. 24	4	13	<.2	<.4	1	<.4	590	<8	<.6	<.6	<180	--	

< LESS THAN VALUE INDICATED
 -- NOT DETERMINED
 ND SPECIFICALLY SOUGHT, NOT DETECTED
 B BOTTOM SAMPLE

NOTE: ALL SAMPLES COLLECTED AT SURFACE EXCEPT AS INDICATED.

STREAMS TRIBUTARY TO LAKE ONTARIO

04245854 ONEIDA LAKE, USGS STATION NO. 14, N.Y.

LOCATION.--Lat 43°11'20", long 75°56'00", Oswego County, at U.S. Geological Survey buoy No. 14.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1968 (discontinued).

REMARKS.--Field determinations of alkalinity, specific conductance and pH of some samples on file in district office in Albany, N.Y. All samples filtered with 0.45 micron pressure filter at time of collection. Additional determinations and observations of biologic parameters of water and bed material at this sampling site on file in district office. Biological samples include phytoplankton concentrations, plant pigments (i.e., chlorophylls a and b), total seston, and Secchi disc readings.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DEPTH (FT)	TEMP-ERATURE (DEG C)	DISS-OLVED OXYGEN	SILICA (SIG2)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HCO3)
FEB.												
13...	1300	0	0	13.3	4.4	29	7.7	.30	4.4	.9	.00	83
13...	1301	20	0	13.3	2.2	40	9.4	.57	5.3	1.1	-.00	103
MAY												
08...	1115	0	10	9.9	.7	38	8.0	.52	4.5	1.2	.00	98
08...	1116	10	10	10.0	--	--	--	--	--	--	--	--
08...	1117	20	10	9.9	--	--	--	--	--	--	--	--
28...	0600	0	14	9.7	.2	44	9.4	.60	5.4	1.0	.02	111
28...	0700	0	14	9.8	--	--	--	--	--	--	--	--
28...	0800	0	14	10.0	--	--	--	--	--	--	--	--
28...	0900	0	14	10.4	--	--	--	--	--	--	--	--
28...	1000	0	14	10.3	.2	44	9.4	.62	5.6	1.0	.00	111
28...	1100	0	14	10.5	--	--	--	--	--	--	--	--
28...	1200	0	15	10.6	--	--	--	--	--	--	--	--
28...	1300	0	15	10.7	--	--	--	--	--	--	--	--
28...	1400	0	16	11.1	--	--	--	--	--	--	--	--
28...	1430	10	16	11.0	.3	44	9.5	.63	5.4	1.0	.00	110
28...	1500	0	16	11.0	--	--	--	--	--	--	--	--
28...	1600	0	17	11.0	--	--	--	--	--	--	--	--
28...	1700	0	17	10.9	--	--	--	--	--	--	--	--
28...	1800	0	17	10.7	.3	44	9.4	.60	5.3	1.0	.00	110
28...	1850	0	17	10.8	--	--	--	--	--	--	--	--
28...	2000	0	17	10.2	--	--	--	--	--	--	--	--
28...	2100	0	17	9.3	--	--	--	--	--	--	--	--
28...	2200	0	17	9.2	.3	44	9.2	.64	5.3	1.0	.00	110
28...	2300	0	16	10.0	--	--	--	--	--	--	--	--
28...	2400	0	16	9.8	--	--	--	--	--	--	--	--
29...	0100	0	16	9.8	--	--	--	--	--	--	--	--
29...	0200	0	16	10.0	.5	45	9.2	.64	5.5	1.1	.02	112
29...	0300	0	15	10.2	--	--	--	--	--	--	--	--
29...	0400	0	14	10.4	--	--	--	--	--	--	--	--
29...	0500	0	14	10.4	--	--	--	--	--	--	--	--
29...	0600	0	14	10.6	.3	46	9.5	.70	5.8	1.2	.02	113
29...	0700	0	14	10.7	--	--	--	--	--	--	--	--
29...	0800	0	15	10.0	--	--	--	--	--	--	--	--
JUNE												
05...	0730	0	17	10.4	--	--	--	--	--	--	--	--
JULY												
02...	0635	0	20	8.9	--	--	--	--	--	--	--	--
AUG.												
20...	1030	0	23	9.2	--	--	--	--	--	--	--	--
SEPT.												
12...	0930	0	20	6.0	6.1	40	8.9	--	4.7	1.1	.04	102
DATE	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
FEB.												
13...	35	8.8	.2	.01	2.0	.67	.12	134	104	36	224	7.5
13...	52	9.6	.1	.01	1.0	.27	.16	172	139	55	297	7.6
MAY												
08...	48	9.6	.2	.04	.6	.30	.02	159	128	48	281	8.0
08...	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
28...	59	10	.1	.01	.4	.03	.09	184	149	58	322	7.9
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	59	10	.0	.01	.2	.01	.11	184	149	58	328	7.8
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	59	10	.0	.00	.2	.13	.12	184	149	59	320	8.2
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	59	11	.1	.01	.2	.00	.05	185	149	59	319	8.2
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	59	11	.0	.00	.1	.11	.20	185	148	58	319	8.1
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
29...	61	10	.0	.02	.1	.00	.15	188	150	58	330	7.9
29...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--
29...	61	12	.0	.01	.1	.01	.11	193	154	61	344	7.9
29...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--
JUNE												
05...	--	--	--	--	--	--	--	--	--	--	--	--
JULY												
02...	--	--	--	--	--	--	--	--	--	--	--	--
AUG.												
20...	--	--	--	--	--	--	--	--	--	--	--	--
SEPT.												
12...	44	9.3	--	.04	.3	.24	.24	165	137	53	297	7.5

04245955 ONEIDA LAKE, USGS STATION NO. 15, N.Y.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DEPTH (FT)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN	SILICA (SI02)	CALCIUM (CA)	MAGNESIUM (MG)	STRONTIUM (SR)	SODIUM (NA)	POTASSIUM (K)	AMMONIA (NH4)	BICARBONATE (HCO3)
JULY												
17...	2400	0	28	13.9	--	--	--	--	--	--	--	--
18...	0001	10	26	14.4	--	--	--	--	--	--	--	--
18...	0002	20	22	4.0	--	--	--	--	--	--	--	--
18...	0003	30	16	1.0	--	--	--	--	--	--	--	--
18...	0100	0	27	14.1	--	--	--	--	--	--	--	--
18...	0200	0	27	14.4	1.2	37	8.0	.54	4.8	1.1	.07	102
18...	0201	10	24	7.2	--	--	--	--	--	--	--	--
18...	0202	20	22	5.3	4.6	37	8.0	.54	4.7	.9	.11	102
18...	0203	30	18	2.6	--	--	--	--	--	--	--	--
18...	0300	0	26	14.5	--	--	--	--	--	--	--	--
18...	0400	0	26	15.1	--	--	--	--	--	--	--	--
18...	0401	10	24	13.8	--	--	--	--	--	--	--	--
18...	0402	20	21	10.0	--	--	--	--	--	--	--	--
18...	0403	30	18	2.1	--	--	--	--	--	--	--	--
18...	0500	0	26	15.0	--	--	--	--	--	--	--	--
18...	0600	0	26	15.3	1.1	38	8.4	.56	4.6	1.0	.02	102
18...	0601	10	24	13.8	--	--	--	--	--	--	--	--
18...	0602	20	21	9.6	4.2	39	8.5	.55	4.6	1.0	.01	102
18...	0603	30	17	4.0	--	--	--	--	--	--	--	--
18...	0700	0	26	14.0	--	--	--	--	--	--	--	--
18...	0800	0	26	13.8	--	--	--	--	--	--	--	--
18...	0801	10	25	13.6	--	--	--	--	--	--	--	--
18...	0802	20	21	8.4	--	--	--	--	--	--	--	--
18...	0803	30	18	2.3	--	--	--	--	--	--	--	--
18...	0930	0	22	8.0	--	--	--	--	--	--	--	--
AUG												
06...	1615	0	23	10.8	3.0	41	9.0	.54	4.8	1.3	.00	106
21...	0630	0	22	--	--	40	8.7	--	4.8	--	.00	--
21...	0800	0	22	7.6	--	--	--	--	--	--	--	--
21...	0900	0	22	7.3	--	--	--	--	--	--	--	--
21...	1000	0	22	7.6	--	40	8.8	--	4.7	--	.00	--
21...	1001	20	--	--	--	40	8.7	--	4.8	--	.62	--
21...	1100	0	22	8.2	--	--	--	--	--	--	--	--
21...	1200	0	22	8.0	--	--	--	--	--	--	--	--
21...	1300	0	22	8.4	--	--	--	--	--	--	--	--
21...	1400	0	22	8.4	4.3	40	8.7	.54	4.8	1.2	.00	105
21...	1401	10	22	--	--	--	--	--	--	--	--	--
21...	1402	20	22	--	--	40	8.6	--	4.8	--	.00	--
21...	1500	0	22	8.4	--	--	--	--	--	--	--	--
21...	1600	0	22	8.0	--	--	--	--	--	--	--	--
21...	1700	0	22	8.4	--	--	--	--	--	--	--	--
21...	1800	0	22	8.0	--	40	8.7	--	4.9	--	.00	--
21...	1801	20	--	--	--	40	8.7	--	4.7	--	.00	--
21...	1900	0	22	8.8	--	--	--	--	--	--	--	--
21...	2000	0	22	8.0	--	--	--	--	--	--	--	--
21...	2100	0	22	8.8	--	--	--	--	--	--	--	--
21...	2200	0	22	8.8	--	40	8.7	--	4.8	--	.45	--
21...	2201	20	--	--	--	41	8.8	--	4.7	--	.12	--
21...	2300	0	22	8.4	--	--	--	--	--	--	--	--
21...	2400	0	22	--	--	--	--	--	--	--	--	--
22...	0100	0	22	8.2	--	--	--	--	--	--	--	--
22...	0200	0	21	8.3	--	41	8.7	--	4.7	--	.00	--
22...	0201	20	--	--	--	40	8.7	--	4.6	--	.00	--
22...	0300	0	21	7.3	--	--	--	--	--	--	--	--
22...	0400	0	21	8.5	--	--	--	--	--	--	--	--
22...	0500	0	21	8.5	--	--	--	--	--	--	--	--
22...	0600	0	21	8.5	--	41	8.8	--	4.7	--	.00	--
22...	0601	20	--	--	--	40	8.6	--	4.7	--	.03	--
22...	0700	0	21	7.6	--	--	--	--	--	--	--	--
22...	0800	0	21	7.9	--	--	--	--	--	--	--	--
28...	1025	0	22	10.6	--	--	--	--	--	--	--	--
SEPT.												
24...	1320	0	21	8.8	--	--	--	--	--	--	--	--

SPECTROGRAPHIC ANALYSES, MICROGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OF COLLECTION	ALUMINIUM (AL)	BARIUM (BA)	BERYLLIUM (BE)	BISMUTH (BT)	BORON (B)	CADMIUM (CD)	CHROMIUM (CR)	COBALT (CO)	COPPER (CU)	GALLIUM (GA)	GERMANIUM (GE)	IRON (FE)	LEAD (PB)
FEB. 13, 1968	30	30	<.6	ND	40	ND	4	<8	10	ND	ND	110	10
MAR. 13	35	30	<.6	ND	20	ND	7	<4	6	ND	ND	100	9
MAY 28	50	36	<.8	<2	17	<.16	15	<8	7	--	<4	110	4
DATE OF COLLECTION	LITHIUM (LI)	MANGANESE (MN)	MOLYBDENUM (MO)	NICKEL (NI)	RUBIDIUM (RB)	SILVER (AG)	STRONTIUM (SR)	TIN (SN)	TITANIUM (TI)	VANADIUM (V)	ZINC (ZN)	ZIRCONIUM (ZR)	
FEB. 13, 1968	4	95	<.6	2	.9	<.3	210	<8	<2	1	ND	ND	
MAR. 13	2	60	<.4	3	.6	<.3	200	<4	1	1	ND	ND	
MAY 28	3	740	<.8	<5	.6	<.4	530	<5	<4	4	<160	--	

< LESS THAN VALUE INDICATED

-- NOT DETERMINED

ND SPECIFICALLY SOUGHT, NOT DETECTED

STREAMS TRIBUTARY TO LAKE ONTARIO

04246000 ONEIDA LAKE AT BREWERTON, N.Y.

LOCATION.--Lat 43°14'24", long 76°08'30", Oneida County, at bridge on U.S. Highway 11 at Brewerton, 100 ft east of gaging station at west end of Oneida Lake.

DRAINAGE AREA.--1,382 sq mi, at dam at Caughdenoy.

PERIOD OF RECORD.--Chemical analyses: December 1967 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, DECEMBER 1967 TO SEPTEMBER 1968

DATE	TIME	DEPTH (FT)	TEMP-ERATURE (DEG C)	DISS-OLVED OXYGEN	SILICA (SI02)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	AMMONIA (NH4)	BICAR-BONATE (HC03)
DEC.												
04...	1430	0	1	13.4	1.5	42	8.7	.60	5.3	1.1	.00	111
JAN.												
17...	1800	0	0	--	2.2	47	9.5	.60	5.4	1.2	.00	112
30...	1215	0	0	12.8	2.1	45	9.8	.59	5.6	.9	.07	110
FEB.												
13...	1615	0	0	--	2.4	39	9.1	.54	5.0	1.1	.01	99
27...	1730	0	0	--	5.1	74	17	.25	5.1	.8	.21	270
MAR.												
13...	0800	0	0	13.4	--	41	8.6	--	--	--	.15	105
13...	1400	0	0	13.4	2.6	40	9.1	.56	5.8	1.1	.00	104
13...	2000	0	0	--	--	41	8.7	--	--	--	.06	105
14...	0200	0	0	--	--	42	8.7	--	--	--	.00	106
20...	0900	0	2	--	2.8	36	8.3	.45	5.5	1.2	.10	93
APR.												
02...	1615	0	2	--	2.6	34	7.5	.44	4.3	1.0	.00	88
16...	0750	0	8	--	.1	43	8.3	.59	5.2	1.1	.01	93
MAY												
01...	0730	0	12	--	.2	41	8.6	.56	4.5	1.2	.05	103
SEPT.												
12...	1030	0	20	8.7	6.2	38	8.7	--	4.7	1.2	.02	90

DATE	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO-GEN (N)	TOTAL PHOS- PHORUS (PO4)	OIS- SOLVED SOLIDS (SUM OF CONSI- TUENTS)	HARD- NESS (CA, MG)	NON- GAR- BONATE HARD- NESS	SPECI- FIC CONDO- UCTANCE (MICRO- MHOS)	PH
DEC.												
04...	55	11	.1	.03	.6	.24	.47	180	141	50	316	7.9
JAN.												
17...	55	10	.1	.01	1.0	.02	.15	187	156	64	321	7.9
30...	53	11	.1	.01	.8	.15	.15	183	153	62	316	7.7
FEB.												
13...	53	9.7	.2	.00	.9	.02	.17	170	135	54	289	7.5
27...	32	9.8	.0	.00	4.5	.01	.04	282	235	34	492	8.1
MAR.												
13...	--	--	--	.04	.9	.17	.12	--	138	52	302	7.7
13...	50	11	.1	.04	.8	.16	.17	172	138	52	299	7.7
13...	--	--	--	.03	.7	.10	.12	--	138	52	302	7.8
14...	--	--	--	.05	.6	.11	.17	--	141	54	305	7.9
20...	47	11	.1	.06	1.1	.14	.16	160	124	48	277	7.5
APR.												
02...	40	9.0	.1	.04	1.0	.10	.28	143	116	44	256	7.4
16...	51	10	.1	.00	.3	.27	.00	173	141	54	304	8.6
MAY												
01...	49	10	.1	.03	.1	.17	.05	166	138	53	293	7.9
SEPT.												
12...	47	9.1	--	.01	.2	.33	.10	163	131	50	282	8.4

04246601 ONEIDA RIVER BELOW DAM, AT CAUGHDENNOY, N.Y.

LOCATION.--Lat 43°16'14", long 76°12'22", Oswego County, at bridge on Caughdenoy Road at Caughdenoy at supplementary gage for station 04246500, 0.1 mile below navigation dam.

DRAINAGE AREA.--1,382 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1957 to September 1958, June 1967 to July 1968.
Water temperatures: October 1957 to September 1956.

REMARKS.--Records for October 1957 to September 1958 published as 4-2845 Oneida River at Caughdenoy, N.Y. Field de- terminations of alkalinity, specific conductance and pH of some samples on file in district office at Albany, N.Y.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	MEAN DIS- CHARGE (CFS)	SILICA (SI02)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH4)	BICAR- BONATE (HC03)	CAR- BONATE (CO3)	SULFATE (SO4)
OCT.											
09...	833	.1	42	10	.62	5.6	.8	.00	105	0	54
NOV.											
14...	5310	.8	42	9.4	.61	5.7	1.1	.15	112	0	56
DEC.											
14...	4110	1.9	44	9.1	.62	5.4	1.0	.12	112	0	54
JAN.											
16...	2290	2.2	45	9.3	.60	5.3	1.2	.00	109	0	54
30...	1850	2.3	40	9.6	.57	5.2	1.0	.15	104	0	50
FEB.											
14...	3080	2.2	41	9.6	.55	5.1	1.0	.01	104	0	58
29...	1750	2.3	42	9.3	.56	5.3	1.0	.09	106	0	55
MAR.											
20...	2310	2.8	34	7.8	.46	5.3	1.1	.10	90	0	40
APR.											
02...	6530	2.4	32	7.3	.45	4.1	.9	.05	84	0	38
16...	5560	.1	38	8.5	.62	5.1	1.0	.00	99	6	54
MAY											
01...	2450	.2	41	8.5	.53	4.7	1.1	.00	96	4	49
22...	3090	1.0	38	8.1	.50	4.6	.9	.12	97	0	46
JUNE											
04...	3270	1.0	39	8.4	.54	4.7	1.0	.10	102	0	48
JULY											
30...	211	5.0	60	8.6	.52	4.8	1.0	.20	106	0	45

STREAMS TRIBUTARY TO LAKE ONTARIO

04246601 ONEIDA RIVER BELOW DAM, AT CAUGHDENNY, N.Y.--Continued
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, OCTOBER 1967 TO JULY 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)
Oct. 09...	9.5	.1	.00	.1	.11	.20	146	60	311	6.0	15
NOV. 14...	10	.2	.00	.4	.12	.12	144	52	318	7.9	6
DEC. 14...	10	.1	.01	.8	.15	.31	148	56	321	7.9	1
JAN. 16...	9.0	.1	.02	.9	.04	.34	150	61	313	7.9	0
30...	10	.1	.01	.9	.28	.08	140	55	301	7.8	1
FEB. 14...	8.8	.2	.02	1.1	.26	.14	142	57	300	7.8	1
29...	11	.1	.01	.9	.06	.17	143	56	308	7.6	0
MAR. 20...	9.9	.1	.06	1.1	.02	--	117	43	258	7.4	2
APR. 02...	6.8	.1	.03	.9	.23	.19	110	41	247	7.8	3
16...	9.4	.1	.00	.3	.24	.02	130	49	308	8.7	9
MAY 01...	9.5	.1	.00	.1	.14	.02	137	52	288	8.4	12
22...	9.1	.1	.01	.5	.00	.03	129	49	277	7.6	15
JUNE 04...	9.0	.1	.00	.1	.10	.12	132	48	290	7.8	17
JULY 30...	9.6	.2	.01	.5	.00	.22	136	49	290	7.3	24

04256000 INDEPENDENCE RIVER AT DONNATTSBURG, N.Y.

LOCATION.--Lat 43°44'50", long 75°20'05", Lewis County, temperature recorder at gaging station on right bank at downstream side of highway bridge at Donnattsburg, 1.2 miles downstream from Chase Lake Outlet, 4.2 miles northeast of Glenfield, and 5 miles upstream from mouth.

DRAINAGE AREA.--91.7 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1959 to September 1961, October 1963 to September 1968.

EXTREMES.--1967-1968:

Water temperatures: Maximum, 26°C July 16, 16; minimum, freezing point on several days during December and January.

Period of record:

Water temperatures: Maximum, 27°C July 24, 1961; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

MONTH	DAY																															AVERAGE	
	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		
OCTOBER																																	
MAXIMUM	16	16	17	18	18	18	14	13	14	14	13	13	12	13	15	16	15	15	11	10	10	10	11	13	13	11	10	9	8	8	13		
MINIMUM	14	14	15	17	18	14	11	12	13	14	13	12	12	11	11	13	15	15	11	10	10	9	9	11	11	10	9	8	7	8	12		
NOVEMBER																																	
MAXIMUM	11	11	12	11	9	7	7	6	6	6	7	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
MINIMUM	8	11	11	9	7	6	6	6	6	6	6	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
DECEMBER																																	
MAXIMUM	--	--	--	--	--	--	--	--	--	--	--	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	2	1	1	0	--		
MINIMUM	--	--	--	--	--	--	--	--	--	--	--	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	--		
JANUARY																																	
MAXIMUM	1	1	0	0	0	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
MINIMUM	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
FEBRUARY																																	
MAXIMUM	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	1	1	2	2	1	2	2	1	2	2	1	1	2	--	--	1		
MINIMUM	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	--	--	1		
MARCH																																	
MAXIMUM	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	3	4	4	4	6	2	
MINIMUM	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	3	2	3	2	
APRIL																																	
MAXIMUM	6	5	7	7	5	7	8	8	9	10	12	13	13	11	12	13	14	15	17	16	16	13	11	8	8	9	11	11	--	--	10		
MINIMUM	4	3	4	6	5	3	4	6	5	5	6	6	9	11	9	8	9	10	11	12	14	13	11	8	7	7	6	7	9	--	8		
MAY																																	
MAXIMUM	9	9	11	11	9	11	12	13	13	13	13	13	12	14	16	16	16	12	14	13	12	13	14	16	16	16	15	14	14	14	13		
MINIMUM	8	8	8	9	8	7	8	9	12	11	12	11	10	13	14	12	12	11	10	11	11	12	13	13	12	13	12	13	12	13	11		
JUNE																																	
MAXIMUM	14	14	16	17	19	22	23	24	22	19	21	18	18	18	17	17	19	18	15	16	16	19	17	17	16	15	13	16	--	--	18		
MINIMUM	12	13	13	14	14	17	18	18	20	16	17	18	16	15	16	15	13	14	15	13	12	14	14	16	16	15	13	13	16	--	--	15	
JULY																																	
MAXIMUM	20	20	18	16	16	18	18	21	21	19	19	22	22	23	24	26	24	26	24	22	22	23	22	20	19	20	19	18	18	19	21		
MINIMUM	18	18	16	15	13	15	15	16	18	16	18	18	18	19	20	21	22	21	20	18	17	18	18	17	16	16	17	18	15	13	15	17	
AUGUST																																	
MAXIMUM	20	19	19	21	20	18	21	20	19	19	17	18	18	17	17	19	18	17	19	18	17	19	20	19	16	15	15	15	16	18	18		
MINIMUM	17	17	16	17	17	16	18	17	18	18	15	14	15	16	14	13	15	15	14	16	17	16	16	17	19	16	13	12	12	13	12	16	
SEPTEMBER																																	
MAXIMUM	16	16	16	16	17	17	17	16	--	--	--	--	--	14	15	16	16	16	16	16	17	17	16	18	17	16	14	13	12	12	--	16	
MINIMUM	13	14	14	13	14	15	13	13	--	--	--	--	--	12	13	14	14	14	14	14	14	14	16	15	15	16	14	13	12	11	11	--	14

STREAMS TRIBUTARY TO LAKE ONTARIO

04257150 BEAVER RIVER AT MOSHIER FALLS, N.Y.

LOCATION (revised).--Lat 43°52'20", long 75°08'10", Herkimer County, at the Niagara-Mohawk Moshier Falls Power Station, at mouth of Sunday Creek and 2.2 miles east of Number Four.

DRAINAGE AREA.--184 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1955 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 21°C on several days during July and August; minimum, 1°C on many days November to February.

Period of record:

Water temperatures: Maximum, 23°C Sept. 10, 1959; minimum, 1°C on many days during winter periods some years.

COOPERATION.--Water temperature record furnished by the Niagara Mohawk Power Corporation.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(ONCE-DAILY MEASUREMENT BETWEEN 0900 AND 1100)

MONTH	DAY																															AVER- AGE
	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	
OCTOBER..	16	15	15	15	15	14	12	14	13	13	13	13	12	11	12	13	13	11	10	10	9	11	11	10	8	9	8	8	8	8	12	
NOVEMBER.	9	9	9	8	5	3	3	4	4	5	5	4	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1	4		
DECEMBER.	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1		
JANUARY..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	1		
FEBRUARY.	1	1	1	2	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
MARCH....	2	2	2	2	2	2	2	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3		
APRIL....	3	3	4	5	5	3	4	4	4	5	6	6	6	7	7	7	8	9	9	10	11	11	11	9	8	8	7	8	9			
MAY.....	8	8	8	9	8	9	8	9	10	10	11	10	11	11	11	12	12	11	11	11	11	11	11	11	12	12	13	13	12	11		
JUNE.....	12	13	13	13	14	15	15	16	17	17	18	17	17	16	16	16	15	16	16	15	15	14	16	16	16	16	14	14	15	15		
JULY.....	17	18	18	16	17	17	17	18	17	18	18	18	18	18	18	20	20	20	21	21	18	20	20	20	19	21	19	19	19	19		
AUGUST...	19	19	19	20	21	21	20	20	21	21	20	19	20	20	19	20	20	20	20	19	19	19	20	20	19	19	19	18	18	20		
SEPTMBER	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17	18	18	18	18	18	17	18	18	18	18	18	17	17	17	18		

04260500 BLACK RIVER AT WATERTOWN, N.Y.

LOCATION.--Lat 43°59'08", long 75°55'30" (revised), Jefferson County, at gaging station at Vanduzee Street Bridge in Watertown and 1.6 miles from dam at Watertown Municipal Power Plant.

DRAINAGE AREA.--1,876 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1955 to September 1966, August 1965 to September 1968.

Water temperatures: October 1955 to September 1959, July 1962 to September 1968.

EXTREMES, 1967-1968:

Water temperatures: Maximum 25°C July 19; minimum, 2°C on several days during January to March.

Period of record:

Water temperatures: Maximum, 28°C July 28, 1984; minimum, freezing point on many days during winter periods some years.

REMARKS.--Water temperature measurements made at Watertown Municipal Power Plant, lat 43°58'45", long 75°53'50".

COOPERATION.--Water temperature record furnished by the city of Watertown.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CF5)	SILICA (SiO2)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH4)	BICAR- BONATE (HCO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)
OCT.												
23...	1330	5190	--	13	2.3	--	--	--	32	13	.8	--
NOV.												
15...	1500	9480	--	14	2.4	--	--	--	37	13	1.8	--
DEC.												
13...	1030	6660	--	15	2.1	--	--	--	40	24	3.0	--
JAN.												
23...	1545	2280	--	+	2.2	--	--	--	34	14	.8	--
FEB.												
27...	1335	1040	8.2	15	3.1	4.6	.6	--	36	20	5.5	.2
MAR.												
25...	1525	15600	4.4	12	1.2	1.6	.9	--	37	9.6	2.0	.1
APR.												
19...	1335	2470	--	13	1.8	--	--	--	31	13	2.7	--
MAY												
24...	1425	5510	4.1	11	1.1	2.1	.4	--	28	11	1.0	.1
JUNE												
18...	1310	1720	--	13	2.0	--	--	--	37	12	3.0	--
JULY												
15...	1000	2140	5.1	12	1.7	2.3	.4	.00	30	7.1	4.0	.1
AUG.												
09...	0840	1650	5.5	17	2.8	3.8	.5	.07	40	20	4.0	.2
SEPT.												
04...	0850	1200	--	14	4.9	--	--	.05	34	17	3.0	--

STREAMS TRIBUTARY TO ST. LAWRENCE RIVER

04263000 OSWEGATCHIE RIVER NEAR HEUVELTON, N.Y.

LOCATION.--Lat 44°35'38", long 75°22'45" (revised), St. Lawrence County, at gaging station 1.5 miles downstream from Beaver Creek and 2.5 miles upstream from Heuvelton.

DRAINAGE AREA.--973 sq mi

PERIOD OF RECORD.--Chemical analyses: October 1955 to September 1956, June 1966 to September 1968.
Water temperatures: October 1955 to September 1956.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SILICA (SI02)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH4)	BICAR- BONATE (HCO3)	SULFATE (SO4)	CHLOR- IDE (CL)	FLUOR- IDE (F)	
03... NOV.	1045	387	--	11	2.4	--	--	--	37	16	2.4	--	
01... DEC.	1015	1450	--	10	2.6	--	--	--	28	16	3.0	--	
04... JAN.	1015	1080	--	13	3.2	--	--	--	30	25	2.4	--	
03... FEB.	1100	1100	--	12	2.7	--	--	--	31	20	2.8	--	
02... MAR.	1115	1610	--	12	3.4	--	--	--	40	15	4.0	--	
06... APR.	1035	696	7.4	13	3.2	3.3	1.0	--	40	16	3.0	.2	
11... MAY	1255	2530	4.2	11	2.1	2.0	.9	--	28	13	2.0	.2	
06... JUNE	1230	1260	--	11	2.6	--	--	--	30	14	2.0	--	
03... JULY	0900	1400	4.2	14	3.6	2.7	.8	--	46	13	4.0	.2	
12... AUG.	0840	455	--	11	3.0	--	--	--	.06	32	15	2.0	--
02... SEPT.	0945	411	--	13	3.1	--	--	--	.05	38	20	3.2	.2
09... SEPT.	0830	449	3.0	12	2.6	4.7	1.1	.01	35	17	4.0	.2	

DATE	NITRITE (NO2)	NITRATE (NO3)	ORGANIC NITRO- GEN (N)	TOTAL PHOS- PHORUS (PO4)	DIS- SOLVED SOLIDS FRESH- WATER (180 C)	HARD- NESS (CA,MG)	NON- CAR- BONATE HARD- NESS	ALKAL- LINEITY AS CACO3	SPECIF- IC CON- DUCTANCE MICRO- MHOS)	PH	COLOR	TEMP- ERATURE (DEG C)
03... NOV.	--	--	--	--	--	38	8	30	107	7.2	--	16
01... DEC.	--	--	--	--	--	36	13	23	91	7.0	--	8
04... JAN.	--	--	--	--	--	46	21	25	105	7.0	--	1
03... FEB.	--	--	--	--	--	41	16	25	107	6.9	--	0
02... MAR.	--	--	--	--	--	44	11	33	112	7.0	--	0
06... APR.	--	.3	--	--	74	46	13	33	113	7.0	25	0
11... MAY	--	1.0	--	--	64	36	13	23	87	7.0	28	7
06... JUNE	--	--	--	--	--	38	13	25	93	7.2	--	11
03... JULY	--	.8	--	--	82	50	12	38	123	7.4	45	16
12... AUG.	.01	.7	.00	.11	--	40	14	26	93	6.7	--	24
02... SEPT.	.01	.3	.07	.06	--	46	14	31	116	7.4	--	22
09... SEPT.	.01	.2	.08	.02	62	40	11	29	110	7.4	8	20

04264000 ST. LAWRENCE RIVER AT OGDENSBURG, N.Y.
(International Hydrological Decade River Station)

LOCATION.--Lat 44°41'58", long 75°30'18", St. Lawrence County, at upstream side of ferry dock, just upstream of Oswegatchie River at Ogdensburg and 0.5 mile upstream from gaging station.

DRAINAGE AREA.--295,200 sq mi, including that of Oswegatchie River.

PERIOD OF RECORD.--Chemical analyses: October 1955 to September 1956, February 1966 to September 1968.
Water temperatures: October 1955 to September 1956.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS- CHARGE (CFS)	SILICA (SI02)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH4)	BICAR- BONATE (HCO3)	SULFATE (SO4)	CHLOR- IDE (CL)	FLUOR- IDE (F)	NITRITE (NO2)
03... NOV.	231000	.4	37	7.4	--	--	--	110	28	27	.1	--
01... DEC.	267000	.6	39	7.7	12	1.1	--	109	27	26	.1	--
04... JAN.	284000	.4	40	7.7	12	1.0	--	113	27	29	.2	--
03... FEB.	235000	.2	37	7.0	12	1.4	--	111	28	27	.2	--
02... MAR.	250000	.4	40	8.0	12	1.4	--	117	28	29	.1	--
06... APR.	237000	2.5	33	6.7	8.8	1.2	--	96	25	20	.1	--
09... MAY	261000	.1	40	8.3	11	1.6	--	112	28	27	.1	--
06... JUNE	263000	.1	35	7.3	11	1.3	--	113	26	26	.2	--
03... JULY	240000	.4	39	5.8	11	1.3	--	110	24	27	.2	--
12... AUG.	253000	.3	42	7.8	12	1.2	.04	113	28	26	.2	.00
02... SEPT.	256000	.5	40	7.6	12	1.4	.09	110	29	29	.1	.00
03... SEPT.	268000	.4	36	7.9	12	1.3	.01	109	27	28	.0	.00

04264000 ST. LAWRENCE RIVER AT OGDENSBURG, N.Y.--Continued
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	NITRATE (MOS)	ORGANIC NITROGEN (N)	TOTAL PHOSPHORUS (PO4)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	ALKALINITY AS CaCO3	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	CLOR	TEMPERATURE (CEG C)
OCT. 03...	.1	--	.37	191	123	33	90	323	7.6	4	14
NOV. 01...	.1	--	.07	175	129	40	89	316	7.5	1	9
DEC. 04...	.2	--	.02	178	132	39	93	325	7.3	0	3
JAN. 03...	.1	--	.02	180	122	31	91	334	7.6	2	2
FEB. 02...	.3	--	.04	196	133	37	96	333	7.5	3	0
MAR. 06...	.1	--	.04	143	110	31	79	271	7.4	5	1
APR. 05...	.2	--	.20	179	134	42	92	324	7.1	3	3
MAY 06...	.2	--	.21	172	128	35	93	319	7.6	6	7
JUNE 03...	.3	--	.00	179	122	32	90	320	7.8	7	12
JULY 12...	.2	.03	.08	201	137	44	93	328	7.5	9	18
AUG. 02...	.2	.10	.10	179	131	41	90	326	7.7	--	--
SEPT. 03...	.1	.02	.12	177	122	33	89	319	7.8	--	19

ST. LAWRENCE RIVER MAIN STEM

04264331 ST. LAWRENCE RIVER NEAR MASSENA, N.Y.
 (International Hydrological Decade River Station)

LOCATION.--Lat 45°00'19", long 74°48'05", St. Lawrence County, at St. Lawrence Power Dam on Lake St. Lawrence, at gaging station, St. Lawrence River at Cornwall, Ontario, Canada - No. 2MC-2, of the Canadian Department of Northern Affairs and National Resources, Water Resources Division, 2.6 miles upstream from Grass River and 5.7 miles northeast of Massena.

DRAINAGE AREA.--296,000 sq mi.

PERIOD OF RECORD.--Water temperature: October 1955 to October 1958, January 1966 to September 1968.

EXTREMES, 1967-68:

Water temperatures: Maximum, 22.0°C on many days during July and August; minimum, freezing point on many days during January to March.

Period of Record:

Water temperatures (1966-68): Maximum, 24.0°C Aug. 10, 11, 1967; minimum, freezing point on many days during winter periods.

REMARKS.--Measurements made approximately 68 ft below normal forebay level. Records for period October 1955 to October 1958 collected at Aluminum Company of America Massena Canal Power Station and are unpublished.

COOPERATION.--Water temperature record furnished by the Power Authority of the State of New York.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (ONCE-DAILY MEASUREMENT BETWEEN 1900 AND 2300)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	11.0	4.0	1.0	0.0	0.0	2.0	7.0	12.0	16.0	22.0	21.0
2	17.0	11.0	4.0	1.0	0.0	0.0	2.0	7.0	12.0	17.0	22.0	21.0
3	17.0	11.0	4.0	1.0	0.0	0.0	3.0	7.0	12.0	17.0	22.0	21.0
4	17.0	11.0	4.0	0.0	0.0	0.0	3.0	8.0	13.0	17.0	22.0	21.0
5	17.0	11.0	4.0	1.0	0.0	0.0	3.0	8.0	13.0	17.0	22.0	21.0
6	16.0	10.0	4.0	0.0	0.0	0.0	3.0	8.0	13.0	17.0	22.0	21.0
7	16.0	10.0	4.0	1.0	0.0	0.0	3.0	8.0	13.0	17.0	22.0	21.0
8	16.0	9.0	4.0	0.0	0.0	1.0	4.0	8.0	14.0	17.0	22.0	21.0
9	16.0	9.0	4.0	0.0	0.0	1.0	4.0	8.0	14.0	18.0	22.0	21.0
10	16.0	9.0	4.0	1.0	0.0	1.0	4.0	8.0	14.0	18.0	22.0	21.0
11	16.0	9.0	3.0	0.0	0.0	1.0	5.0	8.0	14.0	18.0	22.0	21.0
12	16.0	9.0	3.0	1.0	0.0	1.0	5.0	8.0	14.0	18.0	22.0	21.0
13	16.0	9.0	3.0	1.0	0.0	1.0	6.0	8.0	14.0	19.0	22.0	21.0
14	16.0	8.0	3.0	1.0	0.0	1.0	6.0	8.0	16.0	19.0	22.0	20.0
15	16.0	7.0	3.0	1.0	1.0	1.0	6.0	8.0	15.0	19.0	22.0	20.0
16	16.0	7.0	3.0	1.0	0.0	0.0	6.0	9.0	15.0	20.0	22.0	20.0
17	16.0	7.0	3.0	1.0	0.0	0.0	6.0	9.0	15.0	20.0	22.0	20.0
18	16.0	7.0	3.0	1.0	1.0	1.0	6.0	10.0	15.0	21.0	22.0	21.0
19	16.0	7.0	3.0	1.0	1.0	1.0	7.0	10.0	15.0	21.0	22.0	21.0
20	16.0	6.0	3.0	0.0	1.0	1.0	7.0	10.0	16.0	21.0	22.0	20.0
21	16.0	6.0	3.0	0.0	1.0	1.0	7.0	10.0	15.0	21.0	22.0	21.0
22	16.0	6.0	3.0	1.0	1.0	1.0	7.0	10.0	15.0	21.0	21.0	21.0
23	16.0	6.0	3.0	0.0	1.0	0.0	7.0	11.0	16.0	21.0	21.0	21.0
24	16.0	6.0	3.0	0.0	1.0	0.0	7.0	11.0	16.0	21.0	21.0	21.0
25	16.0	6.0	3.0	0.0	1.0	0.0	7.0	11.0	16.0	21.0	21.0	21.0
26	16.0	6.0	3.0	0.0	1.0	0.0	7.0	11.0	16.0	22.0	21.0	20.0
27	16.0	6.0	2.0	0.0	1.0	0.0	7.0	11.0	16.0	22.0	21.0	20.0
28	16.0	6.0	2.0	0.0	1.0	1.0	7.0	11.0	16.0	22.0	21.0	20.0
29	16.0	6.0	2.0	0.0	0.0	1.0	7.0	12.0	16.0	22.0	21.0	20.0
30	16.0	6.0	2.0	0.0	0.0	1.0	7.0	12.0	16.0	21.0	21.0	19.0
31	16.0	--	2.0	0.0	--	2.0	--	12.0	--	22.0	21.0	--
AVERAGE	14.6	8.0	3.0	0.5	0.5	0.5	5.5	9.6	14.5	19.5	21.5	20.5

STREAMS TRIBUTARY TO ST. LAWRENCE RIVER

04289500 DEER RIVER AT BRASHER IRON WORKS, N.Y.

LOCATION.--Lat 44°53'32", long 74°41'28", St. Lawrence County, at gaging station 400 ft upstream from highway bridge, at Brasher Iron Works, 3.8 miles upstream from mouth, and 3.8 miles downstream from Lawrence Brook.

DRAINAGE AREA.--189 sq mi.

PERIOD OF RECORD.--Chemical analyses: August 1965 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DATE	TIME	DIS- CHARGE (CFS)	SILICA (SiO ₂)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	AMMONIA (NH ₄)	BICAR- BONATE (HCO ₃)	SULFATE (SO ₄)	CHLO- RIDE (CL)	FLUO- RIDE (F)
OCT.												
24...	0720	184	--	13	2.9	--	--	--	36	12	1.0	--
NOV.												
17...	0840	137	--	18	5.6	--	--	--	54	23	2.5	--
DEC.												
19...	0825	337	--	16	9.7	--	--	--	49	19	2.1	--
JAN.												
24...	0835	115	--	19	5.7	--	--	--	66	18	2.9	--
FEB.												
23...	0820	103	--	19	6.9	--	--	--	71	19	2.5	--
MAR.												
18...	1400	600	4.8	14	4.7	1.8	2.2	--	50	14	3.0	.1
APR.												
19...	0805	147	--	16	3.9	--	--	--	54	11	1.2	--
MAY												
22...	0915	674	--	18	4.1	--	--	--	54	9.6	1.0	--
JUNE												
19...	0715	75	--	15	5.1	--	--	--	46	11	1.7	--
JULY												
23...	0710	66	--	14	6.6	--	--	.16	54	10	3.5	--
AUG.												
22...	0715	95	4.0	18	7.0	--	--	.02	70	12	1.9	--
SEPT.												
20...	0755	58	--	17	4.7	--	--	.14	60	.11	3.0	--

DATE	NITRITE (NO ₂)	NITRATE (NO ₃)	ORGANIC NITRO- GEN (N)	TOTAL PHOS- PHORUS (PO ₄)	DIS- SOLVED SOLIDS (RESI- DUE AT 10° C)	HARD- NESS (CA, MG)	NON- CAP- IT PATF HARD- NESS	ALKA- LINITY AS CACO ₃	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	COLOR	TEMPER- ATURE (DEG C)
OCT.												
24...	--	--	--	--	--	44	14	30	88	7.3	--	7
NOV.												
17...	--	--	--	--	--	68	22	46	144	7.3	--	0
DEC.												
19...	--	--	--	--	--	80	40	40	128	7.2	--	1
JAN.												
24...	--	--	--	--	--	71	17	54	153	7.3	--	0
FEB.												
23...	--	--	--	--	--	76	18	58	157	7.3	--	0
MAR.												
18...	--	2.9	--	--	75	54	13	41	119	7.0	35	0
APR.												
19...	--	--	--	--	--	56	12	44	116	7.1	--	9
MAY												
22...	--	--	--	--	--	62	18	44	114	7.2	--	12
JUNE												
19...	--	--	--	--	--	58	4	54	124	7.3	--	18
JULY												
23...	.11	.8	.10	.49	--	62	18	44	115	7.3	--	23
AUG.												
22...	.02	.4	.25	.43	--	74	14	57	144	7.3	--	18
SEPT.												
20...	.02	.5	.07	.68	--	62	13	49	130	7.4	--	16

04276500 BOUQUET RIVER AT WILLSBORO, N.Y.

LOCATION.--Lat 44°21'30", long 73°23'50", Essex County, at gaging station at Willsboro, 0.5 mile upstream from bridge on State Highway 22, 2.5 miles downstream from North Branch Bouquet River, and 3 miles upstream from mouth.

DRAINAGE AREA.--275 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1966 to June 1968 (discontinued).

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DATE	TIME	DIS- CHARGE (CFS)	SILICA (SiO ₂)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO ₃)	SULFATE (SO ₄)	CHLO- RIDE (CL)	FLUO- RIDE (F)	TEMPER- ATURE (DEG C)
OCT.												
24...	1030	221	--	9.8	2.4	--	--	30	11	2.0	--	
NOV.												
21...	1145	96	--	15	4.0	--	--	52	13	3.2	--	
DEC.												
20...	1020	163	--	12	3.2	--	--	38	16	3.0	--	
JAN.												
22...	1530	63	--	13	3.6	--	--	54	13	4.5	--	
FEB.												
20...	1630	50	--	17	4.8	--	--	60	14	4.8	--	
MAR.												
21...	--	900	7.3	11	3.4	2.7	1.2	34	14	3.7	--	
APR.												
23...	0930	212	--	13	2.3	2.6	.4	38	12	3.4	--	
MAY												
21...	1325	1030	1.9	10	2.0	1.8	.4	27	10	2.0	--	
JUNE												
20...	1045	208	--	15	3.4	--	--	52	12	4.0	--	

04276500 BOUQUET RIVER AT WILLSBORO, N.Y.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	FLUORIDE (PP)	NITRATE (NO3)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	ALKALINITY AS CaCO3	SPECIFIC CONDUCTANCE (MICROHMOS)	PH	COLOR	TEMPERATURE (DEG C)
OCT. 24...	--	--	--	34	9	25	81	7.1	--	7
NOV. 21...	--	--	--	54	11	43	124	7.4	--	1
DEC. 20...	--	--	--	43	12	31	103	7.3	--	0
JAN. 22...	--	--	--	48	4	44	131	7.4	--	0
FEB. 20...	--	--	--	62	13	49	140	7.3	--	--
MAR. 21...	.1	.8	.68	42	14	28	102	7.1	24	0
APR. 23...	--	--	--	42	11	31	100	7.3	--	8
MAY 21...	.1	.3	.45	33	11	22	78	7.2	22	10
JUNE 20...	--	--	--	72	30	43	125	7.6	--	16

ANALYSES OF FIELD-MEASURED SAMPLES COLLECTED AT MISCELLANEOUS SITES IN OAKLAND COUNTY, MICH.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, NOVEMBER 1967

STATION NAME	LATITUDE AND LONGITUDE	DAY	BICARBONATE (CO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	PHOSPHATE (PO4)	HARDNESS AS CaCO3		SPECIFIC CONDUCTANCE (MICROHMOS AT 25°C)	pH
								CA, MG	NON-CARBONATE		
Big Lake	424329N0833038	16	168	0	18	10	.05	157	19	285	7.7
Bogle Lake	423705N0833036	15	174	0	35	23	.10	192	49	360	8.1
Buckhorn Lake	424356N0833716	16	234	0	18	11	.10	212	20	370	7.9
Bush Lake	424758N0833657	16	227	0	35	19	.08	212	26	395	8.1
Cass Lake	423657N0832058	16	206	0	15	5.0	.04	185	16	305	8.0
Clear Lake	424853N0831739	16	215	0	50	8.2	.19	232	56	400	7.6
Commerce Lake	423454N0832907	15	--	0	33	26	.11	252	49	450	8.1
Cranberry Lake	424737N0830616	16	152	0	38	14	.06	177	52	315	8.2
Do.	424518N0832957	16	150	0	15	54	.05	166	43	405	8.2
Crooked Lake	424644N0832329	16	207	0	30	3.8	.17	191	21	320	8.0
Dunham Lake	423913N0834047	15	185	0	22	3.2	.15	176	24	280	8.0
Gravel Pit	423652N0830643	15	156	0	65	21	.06	215	87	460	8.0
Indian Lake	424758N0831233	16	194	0	23	6.8	.15	190	31	220	7.6
Long Lake	424733N0831340	16	202	0	23	11	.12	180	14	355	8.2
Lower Long Lake	423510N0831715	15	155	0	32	57	.11	183	56	450	7.5
Lower Pettibone Lake	423714N0833634	15	223	3	22	15	.22	206	23	370	8.3
Lower Straits Lake	423509N0832816	15	154	0	28	23	.07	184	58	335	8.1
Oakland Lake	124225N0832233	16	246	0	39	28	--	252	50	480	7.8
Orchard Lake	423452N0832155	15	155	0	26	22	.05	159	32	330	8.0
Oxbow Lake	423629N0832856	15	212	0	28	19	.15	211	37	385	8.2
Parker Lake	424935N0831439	16	193	0	52	16	.04	224	66	395	7.7
Pine Lake	423545N0832013	15	154	0	26	50	.06	179	53	420	8.2
Pleasant Lake	423838N0832619	15	163	0	38	29	.07	195	61	385	7.9
Pontiac Lake	424020N0832712	15	201	2	28	14	.10	202	37	365	8.3
Sherwood Lake	423548N0833255	15	203	0	110	12	.16	256	91	510	8.1
Lake Sixteen	424517N0831658	16	223	0	53	23	.16	258	75	450	8.2
Square Lake	423629N0831831	15	139	0	17	38	.06	154	40	335	8.1
Do	424632N0831613	16	159	4	26	22	.06	174	44	325	8.4
Stiffs Mill Pond	424709N0833734	16	326	0	37	15	.15	307	40	515	7.7
Sylvan Lake	423727N0831942	15	224	0	39	38	.16	242	58	495	8.2
Upper Straits Lake	423439N0832343	15	94	3	-22	33	.08	173	3	350	8.3
Valley Lake	424804N0833113	16	183	0	19	7.2	.06	172	22	295	7.5
Walled Lake	423148N0832912	--	--	--	--	--	--	--	--	--	--
Walters Lake	424602N0832038	16	156	0	33	12	.08	176	48	310	8.0
Williams Lake	424028N0832507	15	183	0	26	23	.06	183	33	335	8.2
Wolverine Lake	423332N0832903	15	177	0	22	62	.21	196	51	485	7.3

CHEMICAL-QUALITY INVESTIGATIONS OF COLD WATER STREAMS IN MICHIGAN

A series of specific conductance measurements was obtained as part of a water-resource investigation of the cold-water streams of Michigan in cooperation with the Michigan State Department of Conservation. The purpose of these measurements is to determine the range in specific conductance under various stream-flow conditions. The results, together with continuous thermograph records, ground-water records, stream-flow records, and other hydrologic data, will be used to determine the relationship of hydrologic factors to recreational values.

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1965 TO SEPTEMBER 1968

DATE	TIME (24 HR)	DIS- CHARGE (CFS)	WATER TEM- PERATURE (°C)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)	DATE	TIME (24 HR)	DIS- CHARGE (CFS)	WATER TEM- PERATURE (°C)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)
STREAMS TRIBUTARY TO LAKE SUPERIOR									
04031000 BLACK RIVER NEAR BESSEMER (LAT 46 30 41 LONG 090 04 28)									
OCT. 5, 1967	1245	35.7	10	140	MAR. 19, 1968	0920	2900	1	50
NOV. 8	1250	396	0	55	MAY 7	1410	182	9	70
DEC. 6	1000	137	0	80	JUNE 11	1000	A112	19	60
JAN. 4, 1968	0915	43.1	0	130	JULY 16	1400	A264	24	50
MAR. 13	1000	50.3	0	140	AUG. 14	1530	A98	18	90
04033000 MIDDLE BRANCH ONTONAGON RIVER NEAR PAULDING (LAT 46 21 25 LONG 089 04 38)									
OCT. 3, 1967	1700	114	13	150	MAY 9, 1968	1410	163	10	120
DEC. 8	1500	158	0	110	JULY 19	1030	A240	19	110
JAN. 2, 1968	1400	103	0	115	AUG. 29	1200	A99	14	150
STREAMS TRIBUTARY TO LAKE MICHIGAN									
04049500 MANISTIQUE RIVER AT GERMFAK (LAT 46 14 00 LONG 085 55 44)									
NOV. 2, 1967	1015	570	6	95	JAN. 19, 1968	1205	A478	16	185
NOV. 29	0940	306	1	210	SEP. 17	1030	A445	18	170
DEC. 20	0930	428	0	185					
04058000 MIDDLE BRANCH ESCANABA RIVER NEAR ISHPEMING (LAT 46 23 40 LONG 087 45 30)									
OCT. 27, 1967	1205	534	5	80	APR. 24, 1968	0745	362	7	50
DEC. 19	1400	67.1	0	85	MAY 21	0930	A187	11	50
JAN. 12, 1968	1130	48.8	0	90	JULY 3	1400	A268	14	40
FEB. 14	1115	39.0	0	90	JULY 25	1820	A126	20	70
04122500 PERE MARQUETTE RIVER AT SCOTTVILLE (LAT 43 58 40 LONG 086 16 45)									
OCT. 3, 1967	1625	559	14	315	APR. 10, 1968	1430	702	10	300
NOV. 7	1710	930	3	305	MAY 7	1520	630	9	300
DEC. 5	1530	675	2	325	JUNE 5	1350	726	18	300
JAN. 10, 1968	1140	590	0	340	JULY 9	1015	550	19	330
FEB. 6	1545	1430	0	235	AUG. 6	0980	A462	20	330
MAR. 12	1535	939	1	280	SEP. 10	0930	476	15	345
04123000 BIG SABLE RIVER NEAR FREESOIL (LAT 44 07 15 LONG 086 16 50)									
OCT. 4, 1965	1810	148	10	330	SEP. 10, 1968	1200	122	14	315
AUG. 6, 1966	1230	A109	19	300					
04123500 MANISTEE RIVER NEAR GRAYLING (LAT 44 41 35 LONG 084 50 50)									
OCT. 2, 1967	1150	190	10	295	APR. 1, 1968	0980	211	3	260
NOV. 1	1050	207	7	280	MAY 1	1405	187	10	265
DEC. 1	1235	192	4	300	JUNE 3	1300	181	19	285
JAN. 2, 1968	0845	185	0	290	JULY 1	1300	191	18	265
FEB. 1	1235	197	4	265	AUG. 1	0855	180	14	270
MAR. 1	1255	190	0	290	SEP. 3	1280	174	14	290
04124000 MANISTEE RIVER NEAR SHERMAN (LAT 44 26 10 LONG 085 41 55)									
OCT. 6, 1965	1335	1150	8	270	SEP. 9, 1968	1300	730	14	260
AUG. 5, 1966	1340	A789	18	290					
04125500 PINE RIVER NEAR HOXKYVILLE (LAT 44 12 10 LONG 085 28 00)									
OCT. 4, 1965	1230	310	8	295	SEP. 9, 1968	1555	225	13	315
AUG. 5, 1966	1830	210	18	295					
04126200 LITTLE MANISTEE RIVER NEAR FREESOIL (LAT 44 11 00 LONG 086 10 00)									
OCT. 4, 1965	1435	188	9	295	SEP. 10, 1968	1415	154	14	280
AUG. 6, 1966	1440	A145	18	275					
04127000 BOARDMAN RIVER NEAR MAYFIELD (LAT 44 36 20 LONG 085 31 10)									
OCT. 1, 1965	1205	327	10	270	SEP. 4, 1968	1315	161	16	320
APR. 12, 1966	1235	141	10	245					
04127800 JORDAN RIVER NEAR EAST JORDAN (LAT 45 06 09 LONG 065 05 53)									
OCT. 3, 1967	1415	158	12	320	MAY 13, 1968	1250	168	10	315
NOV. 15	1300	186	2	340	JUNE 10	1100	162	16	325
DEC. 14	1245	207	2	310	JULY 11	1330	A174	14	315
JAN. 17, 1968	1210	184	1	340	JULY 16	1450	177	18	310
FEB. 15	1130	168	0	325	AUG. 12	1125	A150	12	350
MAR. 18	1015	219	3	300	SEP. 16	1015	163	12	360
APR. 18	1610	187	10	320					
04128000 STURGEON RIVER NEAR WOLVERINE (LAT 45 17 55 LONG 064 36 40)									
OCT. 11, 1967	1215	A210	7	290	APR. 2, 1968	1130	258	5	305
NOV. 2	1345	395	7	345	MAY 1	1235	198	6	330
DEC. 12	1600	317	3	350	JUNE 6	0825	187	16	350
JAN. 15, 1968	1230	203	0	350	JULY 2	1125	194	14	325
FEB. 14	1300	227	0	345	AUG. 1	1305	192	14	330
MAR. 5	1245	200	1	330	SEP. 3	1150	168	18.5	370

A DAILY MEAN DISCHARGE.

CHEMICAL-QUALITY INVESTIGATIONS OF COLD WATER STREAMS IN MICHIGAN
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1965 TO SEPTEMBER 1968

DATE	TIME (24 HR)	DIS- CHARGE (CFS)	WATER TEM- PERATURE (°C)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)	DATE	TIME (24 HR)	DIS- CHARGE (CFS)	WATER TEM- PERATURE (°C)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued									
04129000 PIGEON RIVER NEAR VANDERBILT (LAT 45 10 15 LONG 084 26 20)									
OCT. 9, 1967	0910	77.6	5	360	APR. 2, 1968	0930	76.3	4	300
NOV. 2	1045	190	6	340	MAY 1	0920	78.0	9	320
DEC. 12	1400	113	2	360	JUNE 6	1125	65.2	20	340
JAN. 15, 1968	1020	63.4	0	360	JULY 2	1335	86.3	18	330
FEB. 20	1015	65.9	0	330	AUG. 1	1005	108	16	310
MAR. 5	1005	67.6	1	340	SEP. 3	0950	56.8	14	360
04131500 RAINY RIVER NEAR OCQUEOQ (LAT 45 24 30 LONG 084 10 45)									
OCT. 6, 1965	1500	26.7	8	310	AUG. 14, 1968	0905	42.4	16	385
JULY 15, 1968	1425	16.8	22	300	SEP. 17	1615	32.3	19	355
04135500 AU SABLE RIVER AT GRAYLING (LAT 44 39 35 LONG 084 42 45)									
OCT. 2, 1967	1205	68.0	10	300	MAR. 1, 1968	1000	63.8	0	275
NOV. 1	0820	81.4	6	280	APR. 1	1030	102	4	255
DEC. 1	0945	81.2	1	295	MAY 1	1120	73.2	10	265
JAN. 2, 1968	1030	76.2	0	290	JUNE 3	1545	70.7	16	265
FEB. 1	1025	84.8	1	260	JULY 1	1015	88.7	19	255
04138500 AUGRES RIVER NEAR NATIONAL CITY (LAT 44 10 45 LONG 083 44 15)									
OCT. 10, 1967	0810	29.8	10	540	APR. 9, 1968	0950	158	9	400
NOV. 2	0825	120	8	490	MAY 14	1135	92.8	14	460
DEC. 12	1210	494	2	365	JUNE 6	1400	105	22	300
JAN. 3, 1968	1050	45.4	0	500	AUG. 14	0925	19.4	19	540
FEB. 13	1050	42.9	0	485	SEP. 17	1140	18.8	19	485
04140500 RIFLE RIVER AT SELKIRK (LAT 44 18 50 LONG 084 04 00)									
OCT. 9, 1967	1400	105	10	380	APR. 8, 1968	1455	172	9	370
NOV. 1	1345	130	7	400	MAY 15	1130	142	12	370
DEC. 11	1500	138	2	410	JUNE 11	1445	141	19	380
JAN. 4, 1968	0915	91.0	0	400	JULY 15	1455	92.6	22	360
FEB. 13	1500	125	0	385	AUG. 13	1500	84.5	17	375
MAR. 11	1525	182	3	235	SEP. 16	1330	108	15	390
04152500 TOBACCO RIVER AT BEAVERTON (LAT 43 52 45 LONG 084 28 25)									
OCT. 2, 1967	1445	254	18	410	APR. 1, 1968	1025	499	8	360
NOV. 9	0750	298	2	480	MAY 7	1325	267	12	400
DEC. 13	1130	1930	1	330	JUNE 4	0705	440	16	370
JAN. 11, 1968	0900	246	0	480	JULY 9	1340	419	22	400
FEB. 8	1105	464	1	375	AUG. 5	1510	184	22	440
MAR. 5	1525	244	1	440	SEP. 10	1110	275	18	450

a DAILY MEAN DISCHARGE.

LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN

STREAMS TRIBUTARY TO ST. CLAIR RIVER

Two series of water samples were collected at many selected locations in the Black River basin as part of a comprehensive study of water resources of southeastern Michigan in cooperation with the U. S. Army Corps of Engineers. The purpose of the samples is to determine the chemical quality of water during periods of dry-weather streamflow. The results, together with streamflow records, ground-water records, and geologic studies, are intended as a ground-water reconnaissance aid and as an indication of the quality of water of the area. The samples are believed to be unaffected by surface runoff due to antecedent precipitation and thus represent the chemical quality of water during periods of base flow. The chemical analyses were conducted by field methods.

Chemical analyses in milligrams per liter, May to August 1967

Station number	Station name	Location	Drainage area (sq. mi.)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Chloride (SO ₄)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	Water temperature (°C)	
											Ca, Mg	Non-carbonates			
04159130	Black River at Mills Road	SW 1/4 sec. 3, T. 13 N., R. 14 E.	21.7	May 16 1967	11:05	8.38	183	0	84	12	244	84	470	7.6	14.0
04159135	Carroll Drain at Stringer Road	SW 1/4 sec. 25, T. 13 N., R. 14 E.	10.7	Aug. 1 1967	14:15	1.54	264	0	60	10	272	56	470	7.7	24.5
04159140	Black Creek at Stone Road	SE 1/4 sec. 14, T. 13 N., R. 14 E.	9.91	Aug. 1 1967	09:50	6.58	318	0	140	15	342	134	640	8.0	11.0
04159145	Black River at Deckerville Road	SW 1/4 sec. 25, T. 13 N., R. 14 E.	56.4	May 16 1967	13:30	1.95	364	0	212	24	450	218	920	8.1	11.0
04159150	Black River at Smover Line Road	SW 1/4 sec. 18, T. 12 N., R. 15 E.	77.6	May 16 1967	11:10	23.7	261	0	148	30	368	161	1300	7.9	22.0
04159170	Berry Drain at Range Line Road	SE 1/4 sec. 24, T. 12 N., R. 14 E.	17.2	May 16 1967	13:55	4.46	376	0	168	67	462	154	950	7.8	20.0
04159175	Fye Drain at Range Line Road	SW 1/4 sec. 19, T. 12 N., R. 15 E.	10.1	Aug. 1 1967	08:55	9.88	310	0	164	107	475	197	1020	7.1	19.5
04159180	Black River at Church Road	SW 1/4 sec. 4, T. 11 N., R. 15 E.	126	May 16 1967	09:35	1.60	437	0	137	79	486	128	1005	7.8	18.5
04159190	Eik Creek at Brooks Road	NW 1/4 sec. 11, T. 9 N., R. 13 E.	23.9	May 18 1967	10:15	14.9	387	0	180	109	494	177	1130	8.0	20.0
04159200	Eik Creek at Paldi Road	SE 1/4 sec. 16, T. 10 N., R. 14 E.	39.4	May 16 1967	11:00	2.15	320	7	220	58	442	174	1000	8.5	16.5
04159202	East Branch Spaker and Maple Valley	SE 1/4 sec. 21, T. 10 N., R. 14 E.	19.9	May 16 1967	12:55	2.55	329	0	204	34	487	159	900	8.0	22.0
04159206	McDonald Drain at Eik Creek at Marlette Road	NW 1/4 sec. 3, T. 10 N., R. 14 E.	95.2	May 16 1967	08:20	5.28	375	0	182	22	494	187	870	7.8	18.5
04159215	Frizzie Drain at Morris Road	NE 1/4 sec. 33, T. 11 N., R. 14 E.	16.9	May 16 1967	10:00	2.39	324	0	168	38	450	184	900	7.9	10.0
04159222	Potts Drain at Hall Road	SW 1/4 sec. 17, T. 10 N., R. 15 E.	13.5	Aug. 1 1967	09:15	2.40	353	0	152	39	436	152	800	7.8	10.0
04159225	Potts Drain at Attkens Road	NE 1/4 sec. 8, T. 10 N., R. 15 E.	34.0	May 16 1967	15:20	2.09	310	0	132	13	295	41	540	8.2	18.0
04159230	Eik Creek at French River Road near Crosswalk	NW 1/4 sec. 29, T. 11 N., R. 15 E.	177	May 16 1967	09:55	2.42	368	0	159	32	443	141	900	7.8	18.0
04159250	Black River at Appleton Road	NE 1/4 sec. 35, T. 11 N., R. 15 E.	333	May 16 1967	11:25	29.9	322	0	172	37	494	276	950	8.1	23.0
04159270	Arnet Creek at Black River Road	NE 1/4 sec. 19, T. 10 N., R. 16 E.	13.0	May 16 1967	09:05	38.0	290	0	180	40	418	170	900	8.1	13.0
04159300	Black River at Appleton Road	NE 1/4 sec. 19, T. 10 N., R. 16 E.	376	May 16 1967	12:50	2.87	320	0	152	10	410	147	800	8.2	11.5
04159450	Black Creek at Comstock Road	SE 1/4 sec. 8, T. 9 N., R. 15 E.	9.60	May 16 1967	10:00	95.36	228	0	126	10	441	172	640	8.2	13.5
04159470	Black Creek at Fargo Road	NW 1/4 sec. 24, T. 9 N., R. 15 E.	28.2	May 16 1967	10:45	3.96	300	0	138	20	349	53	680	8.0	17.0
04159486	Black Creek at Black River Road	SW 1/4 sec. 17, T. 9 N., R. 16 E.	50.4	May 16 1967	12:50	1.74	273	0	109	21	336	65	670	8.1	13.5
					12:55	3.37	327	0	59	26	333	85	620	8.2	20.5

04159480	Silver Creek at Jeddo	NW 1/4 sec. 7, T. 8 N., R. 16 E.	26.8	May 16	0910	1.59	232	0	72	20	256	68	525	8.2	10.0
	Road			Aug. 1	0935	1.19	232	0	58	29	264	74	530	7.9	19.0
04159485	Pium Creek at Graham	NE 1/4 sec. 19, T. 8 N., R. 16 E.	11.2	May 16	0813	1.33	297	0	68	23	232	70	490	8.2	9.0
	Road			Aug. 1	1000	59.2	318	5	121	4	301	14	430	8.0	20.5
04159500	Black River near Farpo	NW 1/4 sec. 32, T. 8 N., R. 16 E.	480	Aug. 1	1100		318	5	121	61	397	133	650	8.4	22.6
04159700	Eik Lake Creek at E-53	SE 1/4 sec. 29, T. 8 N., R. 12 E.	23.2	May 16	1305	11.0	288	0	100	14	342	54	650	8.2	13.0
	Road			Aug. 1	0730	3.64	317	0	89	14	347	87	645	8.1	17.0
04159750	North Branch Mill Creek at Brown City	SE 1/4 sec. 10, T. 8 N., R. 12 E.	46.4	May 16, 1961	1355	18.1	281	0	160	22	416	186	790	8.1	14.5
04159800	North Branch Mill Creek at Mason Road	NW 1/4 sec. 13, T. 8 N., R. 13 E.	70.5	May 16	1125	26.2	278	0	210	41	488	228	950	7.8	18.0
	Road			July 31	1540	8.21	292	4	270	44	512	269	950	8.3	29.0
04159850	South Branch Mill Creek at Norman	NW 1/4 sec. 34, T. 8 N., R. 13 E.	24.6	May 16	1315	4.89	226	0	240	50	466	281	940	7.8	15.5
	Road			July 31	1510	1.13	292	0	147	54	408	169	800	7.5	22.0
04159880	South Branch Mill Creek at Fulton	NE 1/4 sec. 23, T. 8 N., R. 13 E.	48.1	May 16	1225	11.8	247	0	272	44	508	306	1000	7.8	15.0
04159890	Mill Creek at Jeddo	NW 1/4 sec. 10, T. 8 N., R. 14 E.	146	Aug. 1	1245	1.51	307	0	202	59	486	234	945	7.9	23.5
	Road			July 31	1650	13.0	305	0	190	67	475	228	990	7.6	24.0
04159900	Mill Creek at Bricker	NW 1/4 sec. 8, T. 7 N., R. 15 E.	169	May 16	1130	50.0	265	4	204	35	438	218	890	8.1	13.5
	Road			Aug. 1	0945	14.2	310	0	177	49	456	202	800	8.1	20.5
04160000	Mill Creek at Black River Road	NW 1/4 sec. 17, T. 7 N., R. 16 E.	185	May 16	1025	63.9	262	3	184	33	422	204	820	8.3	11.5
	Road			Aug. 1	1015	21.6	273	5	153	42	464	144	810	8.4	11.0
04160050	Black River at Vincent Road	NW 1/4 sec. 2, T. 6 N., R. 16 E.	684	Aug. 1	0910	90.2	301	5	115	48	373	122	760	8.4	24.0
	Road			May 15	1705	3.04	252	4	172	38	272	162	610	8.4	15.5
04160100	Hows Drain at Kraft	NW 1/4 sec. 27, T. 7 N., R. 17 E.	9.50	Aug. 1	1300	.20	284	0	80	63	270	37	760	7.9	23.5

LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
STREAMS TRIBUTARY TO ST. CLAIR RIVER

Two series of water samples were collected at many selected locations in the Belle River basin as part of a comprehensive study of water resources of southeastern Michigan in cooperation with the U.S. Army Corps of Engineers. The purpose of the samples is to determine the quality of water during periods of dry-weather streamflow. The results, together with the streamflow data, are being used to determine the effect of streamflow on the quality of water in the area. The samples are believed to be unaffected by surface runoff due to antecedent precipitation and thus represent the chemical quality of water during periods of base flow. The chemical analyses were conducted by field methods.

Chemical analyses in milligrams per liter, May to July 1967

Station number	Station name	Location	Drainage (sq. mi.)	Date sampled	Time	Dissolved (CFB)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃ Ca, Mg	Specific Conductance (micro-mhos at 25°C)	pH	Water temperature (°C)	
04160550	Belle River at Dryden Road	St. sec. 12, T. 6 N., R. 11 E.	8.22	May 15, 1967	1620	4.88	283	4	43	186	476	1140	8.3	14.5	
04160559	Belle River at Hall Road	N. sec. 6, T. 6 N., R. 12 E.	16.9	July 11	1320	3.12	263	0	25	195	476	1040	8.2	14.5	
04160560	Long Lake Drain at Blacks Road	St. sec. 31, T. 7 N., R. 12 E.	10.3	May 15	1250	10.7	289	0	34	102	360	830	8.4	14.5	
04160570	Belle River at Kings River at W. 31	N. sec. 16, T. 7 N., R. 12 E.	18.0	July 31	1435	3.67	283	0	140	150	431	199	8.2	13.5	
04160573	Unnamed Tributary at Ross Road	St. sec. 33, T. 7 N., R. 12 E.	8.18	July 31	1140	6.74	288	0	125	19	321	75	690	8.2	13.5
04160575	Belle River at Clover	N. sec. 2, T. 6 N., R. 12 E.	73.8	May 15	1350	1.35	381	0	125	19	441	129	768	7.9	16.5
04160578	Belle River at Capac	N. sec. 9, T. 6 N., R. 13 E.	92.7	July 31	1350	2.50	329	0	198	40	362	92	723	7.9	18.5
04160580	Belle River at Ber-	N. sec. 11, T. 6 N., R. 13 E.	106	July 31	1045	1.22	384	0	150	150	415	160	790	8.0	12.0
04160584	Com. 21	N. sec. 25, T. 7 N., R. 13 E.	3.01	July 31	1320	46.0	307	0	156	56	417	165	869	8.2	11.5
04160589	Lemon Drain at Hunt	N. sec. 12, T. 6 N., R. 13 E.	21.5	July 31	1220	47.9	303	0	175	60	435	198	920	8.1	14.0
04160599	Sage River at Belle	N. sec. 35, T. 6 N., R. 14 E.	8.05	July 31	1400	52.0	300	0	176	54	445	199	930	8.0	14.0
04160600	Belle River at Memphis	N. sec. 35, T. 6 N., R. 14 E.	151	July 31	1300	13.1	351	0	160	88	450	162	960	8.0	22.0
04160610	Ashby Creek at M-19	N. sec. 11, T. 5 N., R. 14 E.	13.1	July 31	1220	0.8	445	0	200	10	585	238	915	7.9	17.0
04160615	Belle River at U.S.	N. sec. 32, T. 5 N., R. 15 E.	177	July 31	1550	4.11	268	5	190	60	380	156	900	8.4	17.0
04160618	Jerome Creek at Hesson Road	N. sec. 2, T. 4 N., R. 15 E.	10.1	May 15	1355	58.1	283	7	180	56	422	184	860	8.6	14.5
04160620	Belle River at St.	N. sec. 6, T. 4 N., R. 16 E.	200	July 31	1400	16.4	363	5	144	81	445	143	960	8.3	20.0
04160625	Belle River at King	N. sec. 23, T. 4 N., R. 16 E.	216	July 31	1300	89.11	229	0	80	58	314	126	690	7.8	13.0
04160630	Baird Drain at King	N. sec. 36, T. 4 N., R. 16 E.	7.62	May 15	1545	20.2	337	0	128	68	420	144	880	8.2	22.0
					1155	1.33	250	0	74	70	298	94	710	8.2	14.0
					1350	77.7	342	8	142	52	410	140	800	8.5	14.0
					1305	88.0	269	5	143	60	382	166	810	8.5	13.0
					1115	22.7	329	0	120	69	412	142	900	8.1	21.5
					1155	41	275	0	88	60	350	125	750	8.0	11.0

STREAMS TRIBUTARY TO LAKE ST. CLAIR

On June 1, 1967, a series of water samples was collected in the North Branch Clinton River basin as part of a comprehensive program now being carried on in cooperation with the Macomb County Board of Supervisors and Macomb County Road Commission to investigate the chemical quality of streams under low-flow conditions in various parts of the basin. This series of samples will provide a framework for determining the chemical quality of streams under low-flow conditions in various parts of the basin.

Chemical analyses in milligrams per liter, June 1967

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Lithium (Li)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Phosphate (PO ₄)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		To-Specific conductance (micro-mhos at 25°C)	pH	Temperature (°C)
																		Calcium	Magnesium			
04164010 NORTH BRANCH CLINTON RIVER AT ALMONT, MICH. (LAT 42°54'59", LONG 83°02'42", NET sec. 28, T. 5 N., R. 12 E.)																						
June 1, 1967.	2.02					322	0	61	21	2.8	386	335	70						636	8.0	12.0	
04164020 NORTH BRANCH CLINTON RIVER NEAR ALMONT, MICH. (LAT 42°53'33", LONG 83°00'09", NW ¹ sec. 1, T. 5 N., R. 12 E.)																						
June 1, 1967.	3.93					349	0	136	40	3.2	546	430	144						896	8.1	15.5	
04164030 APEL DRAIN NEAR ROMEO, MICH. (LAT 42°51'26", LONG 83°00'02", NW ¹ sec. 13, T. 5 N., R. 12 E.)																						
June 1, 1967.	0.86					288	0	72	48	4.6	430	340	104						707	8.0	16.0	
04164040 NEWLAND DRAIN NEAR ROMEO, MICH. (LAT 42°50'08", LONG 82°58'45", SW ¹ sec. 19, T. 5 N., R. 13 E.)																						
June 1, 1967.	1.27					300	0	91	24	0.8	424	345	98						664	8.0	23.5	
04164045 MAHAFFY DRAIN NEAR ROMEO, MICH. (LAT 42°49'53", LONG 82°58'48", NW ¹ sec. 25, T. 5 N., R. 12 E.)																						
June 1, 1967.	0.52					332	0	62	25	0.7	406	346	74						653	8.1	20.0	
04164050 NORTH BRANCH CLINTON RIVER NEAR ROMEO, MICH. (LAT 42°48'11", LONG 82°58'35", NW ¹ sec. 31, T. 5 N., R. 13 E.)																						
June 1, 1967.	10.7					280	0	86	34	1.2	446	338	97						681	8.2	20.0	
04164090 EAST POND CREEK NEAR LAKEVILLE, MICH. (LAT 42°51'37", LONG 83°05'35", SW ¹ sec. 7, T. 5 N., R. 12 E.)																						
June 1, 1967.	1.27					255	0	43	7.0	1.2	298	256	46						473	7.6	13.5	
04164095 EAST POND CREEK NEAR ROMEO, MICH. (LAT 42°49'01", LONG 83°04'10", SW ¹ sec. 29, T. 5 N., R. 12 E.)																						
June 1, 1967.	1.60					215	0	40	44	0.4	306	230	74						540	8.0	14.0	
04164100 EAST POND CREEK NEAR ROMEO, MICH. (LAT 42°49'21", LONG 83°01'13", NET sec. 27, T. 5 N., R. 12 E.)																						
June 1, 1967.	5.35					266	0	37	29	1.1	300	269	50						543	8.1	16.5	
04164110 EAST POND CREEK NEAR ROMEO, MICH. (LAT 42°48'16", LONG 82°58'49", NW ¹ sec. 6, T. 4 N., R. 13 E.)																						
June 1, 1967.	7.15					280	0	56	51	8.8	424	303	73						686	7.7	19.5	
04164130 NORTH BRANCH CLINTON RIVER NEAR BAY CENTER, MICH. (LAT 42°46'30", LONG 82°56'14", NW ¹ sec. 16, T. 4 N., R. 13 E.)																						
June 1, 1967.	12.1					268	14	72	38	1.4	414	324	80						657	8.6	22.0	
04164190 COON CREEK AT ARMADA, MICH. (LAT 42°50'59", LONG 82°55'36", NET sec. 31, T. 5 N., R. 13 E.)																						
June 1, 1967.	0.55					322	0	63	19	0.8	404	330	66						629	8.2	19.0	

04164390	DEER CREEK NEAR MEADE, MICH. (LAT 42°44'00", LONG 82°50'08", NE½ sec. 31, T. 4 N., R. 14 E.)	1.47				264	0	118	28	0.2	430	360	143	692	7.9	15.0
04164400	DEER CREEK NEAR MEADE, MICH. (LAT 42°43'39", LONG 82°51'33", NW¼ sec. 6, T. 3 N., R. 14 E.)	1.67				266	0	107	30	0.8	443	345	127	678	7.6	15.5
04164420	NORTH BRANCH CLINTON RIVER NEAR MEADE, MICH. (LAT 42°40'25", LONG 82°52'56", SW¼ sec. 14, T. 3 N., R. 13 E.)					290	0	75	42	1.1	422	325	87	688	8.2	
04164450	MCRIBIDE DRAIN NEAR MEADE, MICH. (LAT 42°41'14", LONG 82°55'14", NE¼ sec. 16, T. 5 N., R. 13 E.)	0.15				220	8	54	31	1.6	330	265	71	540	8.5	13.5
04164470	HART DRAIN NEAR MOUNT CLEMENS, MICH. (LAT 42°39'12", LONG 82°52'48", NE¼ sec. 26, T. 3 N., R. 13 E.)	0.07				316	0	48	104	1.7	536	360	101	867	7.5	21.5
04164500	NORTH BRANCH CLINTON RIVER NEAR MOUNT CLEMENS, MICH. (LAT 42°37'45", LONG 82°53'23", NW¼ sec. 2, T. 2 N., R. 13 E.)					297	0	77	44	1.4	444	335	91	707	8.0	
04164520	MIDDLE BRANCH CLINTON RIVER AT UTICA, MICH. (LAT 42°41'00", LONG 83°02'38", NW¼ sec. 16, T. 3 N., R. 12 E.)	1.18				224	0	87	42	1.3	393	285	101	620	7.9	20.0
04164550	KELLER DRAIN AT MACOMB, MICH. (LAT 42°42'30", LONG 83°00'59", NW¼ sec. 2, T. 3 N., R. 12 E.)					300	0	68	51	3.9	456	335	72	738	8.4	16.5
04164600	MIDDLE BRANCH CLINTON RIVER NEAR MACOMB, MICH. (LAT 42°42'03", LONG 82°59'44", SW¼ sec. 1, T. 3 N., R. 12 E.)	1.66				266	0	67	48	5.5	419	298	80	674	8.0	16.5
04164700	HEALY DRAIN AT MACOMB, MICH. (LAT 42°42'58", LONG 82°58'02", SW¼ sec. 31, T. 4 N., R. 13 E.)	4.04				266	0	115	57	5.5	517	360	142	786	8.0	16.0
04164800	MIDDLE BRANCH CLINTON RIVER AT MACOMB, MICH. (LAT 42°42'23", LONG 82°57'33", SW¼ sec. 5, T. 3 N., R. 13 E.)	0.75				250	0	72	47	3.3	410	305	100	662	7.6	15.0
04165200	DUNN DRAIN AT WALDENBURG, MICH. (LAT 42°38'23", LONG 82°57'58", NE¼ sec. 31, T. 3 N., R. 13 E.)	5.51				240	8	91	78	5.2	501	340	130	781	8.4	11.0
04165200	GLOEDE DITCH AT WALDENBURG, MICH. (LAT 42°37'39", LONG 82°57'10", SW¼ sec. 32, T. 3 N., R. 13 E.)	0.48				200	6	80	106	4.0	502	295	121	809	8.4	11.5
04165220	MIDDLE BRANCH CLINTON RIVER AT HEYDREICH ROAD, MICH. (LAT 42°36'23", LONG 82°54'59", private claim 546, T. 2 N., R. 13 E.)	0.70				230	14	79	68	3.8	447	310	98	726	8.6	16.0

LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN

STREAMS TRIBUTARY TO DETROIT RIVER

In August 1967 and April 1968, water samples were collected at many selected locations in the River Rouge basin as a part of a comprehensive study of the water resources of southeastern Michigan. The study is being made in cooperation with the U.S. Army Corps of Engineers. The purpose of the samples is to determine the chemical quality of water during periods of dry-weather streamflow. The samples are being collected during periods of low flow to determine the chemical quality of water during periods of base flow. The samples are believed to be unaffected by surface runoff due to antecedent precipitation and thus represent the chemical quality of water during periods of base flow. The chemical analyses were conducted by field methods.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Diss. charge (cfs)	Bicarbonate (HCO ₃)	Chloride (Cl)	Sulfate (SO ₄)	Hardness as CaCO ₃	Specific conductance (micro-mhos at 25°C)	Water pH			
04165980	River Rouge Tributary at Birmingham	NW $\frac{1}{4}$ sec. 26, T. 2 N., R. 10 E.	21.5	AUG. 24, 1967	1000	1.41	264	0	82	201	366	170	1190	7.7	16.0
04166000	River Rouge at Birmingham	NW $\frac{1}{4}$ sec. 36, T. 2 N., R. 10 E.	36.9	AUG. 24, 1967	1035	3.10	282	0	95	125	387	156	955	8.0	17.0
04166030	Franklin Branch at Birmingham	NW $\frac{1}{4}$ sec. 9, T. 1 N., R. 10 E.	15.4	AUG. 24, 1967	0920	2.56	323	5	44	47	332	63	690	8.4	14.0
04166090	Pebble Creek near Southfield	NE $\frac{1}{4}$ sec. 30, T. 1 N., R. 10 E.	10.3	AUG. 24, 1967	1130	.62	361	0	37	182	376	80	1140	8.2	15.0
04166100	River Rouge at Southfield	SW $\frac{1}{4}$ sec. 32, T. 1 N., R. 10 E.	87.9	AUG. 23, 1967	1600	6.71	262	0	59	89	311	49	710	8.2	17.0
04166200	Franklin Branch at Southfield	SE $\frac{1}{4}$ sec. 28, T. 1 N., R. 10 E.	9.49	AUG. 23, 1967	1645	1.49	298	0	96	125	393	149	1010	8.1	17.0
04166290	Minnow Pond Drain at Quakertown	SW $\frac{1}{4}$ sec. 15, T. 1 N., R. 9 E.	9.18	AUG. 24, 1967	1320	.07	233	0	53	142	313	121	890	8.0	19.0
04166300	Upper River Rouge at Redford	SW $\frac{1}{4}$ sec. 27, T. 1 N., R. 9 E.	17.5	AUG. 24, 1967	0820	1.33	340	4	44	40	330	48	660	8.3	14.0
04166350	Upper River Rouge at Redford	N $\frac{1}{4}$ sec. 20, T. 1 S., R. 10 E.	22.2	AUG. 24, 1967	0945	2.05	301	0	65	97	368	121	890	7.7	16.0
04166400	Bell Creek at Livonia	T. 1 S., R. 9 E.	20.2	AUG. 24, 1967	1030	.62	234	0	58	115	286	94	790	7.9	16.0
04166420	Turbust Creek at Livonia	SW $\frac{1}{4}$ sec. 12, T. 1 S., R. 9 E.	6.68	AUG. 24, 1967	1115	.90	318	0	90	127	395	134	1010	8.1	16.0
04166450	Bell Creek at Redford	T. 1 S., R. 10 E.	40.8	AUG. 24, 1967	0810	2.86	243	0	69	119	309	110	855	7.7	16.0
04166500	River Rouge at Detroit	SW $\frac{1}{4}$ sec. 20, T. 1 S., R. 10 E.	1.87	AUG. 24, 1967	0740	18.3	267	0	67	118	326	107	900	7.6	17.0
04166595	Walled Lake Branch at Northville	NE $\frac{1}{4}$ sec. 22, T. 1 N., R. 8 E.	9.75	AUG. 24, 1967	1430	.005	434	8	36	132	387	25	1090	8.4	20.0
04166600	Walled Lake Branch at Northville	SW $\frac{1}{4}$ sec. 35, T. 1 N., R. 8 E.	22.1	AUG. 24, 1967	1400	.81	343	0	49	31	334	53	665	8.2	19.0
04166650	Johnson Drain near Salem	SW $\frac{1}{4}$ sec. 24, T. 1 S., R. 7 E.	11.5	AUG. 24, 1967	1710	.38	342	0	60	19	342	63	640	7.9	16.0
04166700	Jordan Drain near Northville	SE $\frac{1}{4}$ sec. 3, T. 1 S., R. 8 E.	26.1	AUG. 24, 1967	1330	2.08	315	3	77	68	378	117	790	8.3	15.0
04166750	Middle River Rouge at Plymouth	SW $\frac{1}{4}$ sec. 25, T. 1 S., R. 8 E.	60.7	AUG. 24, 1967	1430	7.49	287	6	80	93	355	115	850	8.5	20.0
04166800	Willow Creek near Turbust Creek	NE $\frac{1}{4}$ sec. 7, T. 2 S., R. 9 E.	6.74	AUG. 24, 1967	1215	.10	459	0	74	292	503	127	1800	8.0	17.0
04166900	Torbust Creek near Nankin Mills	NW $\frac{1}{4}$ sec. 4, T. 2 S., R. 9 E.	24.2	AUG. 24, 1967	1305	1.09	256	4	74	185	360	137	1100	8.4	18.0
04167000	Middle River Rouge near Garden City	NW $\frac{1}{4}$ sec. 6, T. 2 S., R. 10 E.	99.9	AUG. 24, 1967	0655	12.1	---	---	---	---	---	---	---	---	---
04167200	Land Grant at Dearborn	Land Grant 665 T. 2 S., R. 10 E.	307	AUG. 23, 1967	---	---	235	0	59	114	268	95	820	7.6	---
04167300	Lower River Rouge near Denton	SW $\frac{1}{4}$ sec. 28, T. 2 S., R. 8 E.	9.01	AUG. 24, 1967	1145	.17	249	4	46	93	265	58	715	8.4	18.5
04167500	Lower River Rouge near Fellows Creek	SW $\frac{1}{4}$ sec. 25, T. 2 S., R. 8 E.	37.5	AUG. 24, 1967	0940	.28	227	0	91	74	---	---	900	8.0	17.0
04167600	Fellows Creek near Wayne	NE $\frac{1}{4}$ sec. 25, T. 2 S., R. 8 E.	16.0	AUG. 24, 1967	0850	.12	240	0	64	67	306	109	660	8.0	14.5
04168000	Lower River Rouge at Inker	S $\frac{1}{2}$ sec. 19, T. 2 S., R. 10 E.	83.2	AUG. 24, 1967	0755	2.07	249	0	49	93	---	---	765	7.6	16.5
04168100	Lower River Rouge at Dearborn	Land Grant 665 T. 2 S., R. 10 E.	91.9	AUG. 23, 1967	1750	3.38	266	0	51	69	---	---	700	7.7	20.0

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04165990	River Rouge Tributary at Birmingham	NE½ sec.26, T.2 N., R.10 E.	21.5	Apr. 23 0920	10.6	276	0	105	125	356	130	810	7.9	--
04166000	River Rouge at Franklin Branch near Franklin	NW¼ sec.36, T.2 N., R.10 E.	36.9	Apr. 23 0950	16.9	298	0	124	107	404	160	810	8.1	12.0
04166030	Franklin Branch near Franklin	NW¼ sec.9, T.1 N., R.10 E.	15.4	Apr. 23 1035	11.8	278	0	60	62	300	72	580	8.2	13.0
04166090	Pebble Creek near Southfield	NE¼ sec.30, T.1 N., R.10 E.	10.3	Apr. 23 0745	5.35	324	0	62	130	356	91	840	8.0	12.0
04166100	Southfield at Southfield	SW¼ sec.22, T.1 N., R.10 E.	87.9	Apr. 22 1520	49.9	300	0	86	104	358	112	760	8.0	14.0
04166200	Evans Ditch near Southfield	SW¼ sec.28, T.1 N., R.10 E.	9.49	Apr. 23 0835	3.28	371	20	111	161	456	140	1000	8.6	12.0
04166290	Minnow Pond at Upper River Rouge at Farmington	SW¼ sec.15, T.1 N., R.9 E.	9.18	Apr. 23 1120	3.62	314	0	74	47	319	62	580	8.2	13.0
04166300	Upper River Rouge at Farmington	NW¼ sec.27, T.1 N., R.9 E.	17.5	Apr. 23 1650	9.94	307	0	70	47	330	78	575	8.2	15.0
04166350	Upper River Rouge at Redford	N¼ sec.20, T.1 S., R.10 E.	22.2	Apr. 23 8850	14.8	317	0	63	53	341	81	590	8.0	13.0
04166400	Redford at Livonia	NW¼ sec.13, T.1 S., R.9 E.	20.2	Apr. 23 1715	7.44	273	0	92	122	354	130	900	8.1	15.0
04166420	Trumbull Creek at Livonia	SW¼ sec.12, T.1 S., R.9 E.	6.68	Apr. 22 1650	4.91	269	8	78	114	344	116	890	8.1	12.0
04166450	Bell Branch at Redford	SW¼ sec.20, T.1 S., R.10 E.	40.8	Apr. 23 0755	13.2	293	0	92	125	369	129	955	8.0	12.0
04166595	Walled Lake Branch at Northville	NE¼ sec.22, T.1 N., R.8 E.	9.75	Apr. 23 1300	8.39	227	0	67	65	259	73	500	8.1	16.0
04166600	Walled Lake Branch at Northville	SW¼ sec.35, T.1 N., R.8 E.	22.1	Apr. 23 1400	14.1	275	0	73	58	304	78	555	8.1	15.0
04166650	Johnson Drain near Sharon	SE¼ sec.24, T.1 S., R.7 E.	11.5	Apr. 23 1215	6.05	310	2	63	64	358	102	740	8.3	13.0
04166700	Sharon Drain near Northville	SE¼ sec.3, T.1 S., R.8 E.	26.1	Apr. 23 1320	12.7	315	3	110	70	384	124	780	8.3	15.0
04166800	Middle River Rouge at Plymouth	SW¼ sec.25, T.1 S., R.8 E.	80.7	Apr. 23 0855	39.1	293	5	84	41	358	113	800	8.3	14.0
04166800	Willow Creek near Middle River Rouge	NE¼ sec.7, T.2 S., R.9 E.	6.74	Apr. 23 0940	2.22	330	0	68	131	351	81	1000	7.6	12.0
04166900	Tonguish Creek near Nankin Mills	NW¼ sec.4, T.2 S., R.9 E.	24.2	Apr. 23 0755	8.97	303	0	87	122	363	115	900	8.0	12.0
04167000	Middle River Rouge near Garden City	NW¼ sec.6, T.2 S., R.10 E.	99.9	Apr. 23 1100	54.6	297	0	40	51	304	75	840	8.1	14.0
04167200	Lower River Rouge at Dearborn	Land Grant 665, T.2 S., R.10 E.	307	Apr. 23 --	--	288	0	76	118	355	119	910	8.2	--
04167300	Lower River Rouge near Sheldon	SW¼ sec.28, T.2 S., R.8 E.	9.01	Apr. 23 1135	2.44	264	0	73	49	301	84	655	7.9	14.0
04167400	Lower River Rouge near Sheldon	SW¼ sec.28, T.2 S., R.8 E.	12.0	Apr. 23 1107	2.38	276	0	116	42	355	129	710	8.1	13.0
04167500	Lower River Rouge near Sheldon	SW¼ sec.25, T.2 S., R.8 E.	37.5	Apr. 23 1020	10.1	262	0	114	108	330	115	820	8.0	14.0
04167600	Fellows Creek near Wayne	NE¼ sec.25, T.2 S., R.8 E.	16.0	Apr. 23 1000	4.64	242	0	82	70	316	116	700	8.0	13.0
04168000	Lower River Rouge near Dearborn	S¼ sec.19, T.2 S., R.10 E.	82.9	Apr. 23 1210	21.0	271	6	104	104	360	126	900	8.3	15.0
04168100	Lower River Rouge at Dearborn	Land Grant 665, T.2 S., R.10 E.	91.9	Apr. 23 1400	21.5	284	0	106	108	366	133	915	8.0	21.0

LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
STREAMS TRIBUTARY TO LAKE HURON

Two series of water samples were collected at many selected locations in the pine river basin as a part of a comprehensive study of water resources of southeastern Michigan. The study is being made in cooperation with the U. S. Army Corps of Engineers. The locations of the samples are shown on the map. The results, together with the stream-flow measurements, are being reported in a separate publication. The purpose of the samples is to determine the chemical composition of the water and to determine the flow. The purpose of the samples is to determine the chemical composition of the water and to determine the flow. The samples are believed to be unaffected by surface runoff due to antecedent precipitation and thus represent the chemical quality of water during periods of high and low base flow. The chemical analyses were conducted by field methods.

Chemical analyses in milligrams per liter, May to August 1967

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Carbonyl sulfide (SO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃ Mg	Specific conductance (micro-mhos/cm at 25°C)	pH	Water temperature (°C)
04160170	Pine River at Bricker Road	SW $\frac{1}{4}$ sec. 20, T. 7 N., R. 15 E.	6.89	May 15, 1967	1520	1.25	283	0	56	33	285	620	8.0	16.0
04160180	Emmet Drain at Bricker Road	SW $\frac{1}{4}$ sec. 20, T. 7 N., R. 15 E.	7.58	July 31, 1967	1330	.33	387	0	27	33	336	6	8.1	19.5
04160185	Pine River at Fargo Road	SE $\frac{1}{4}$ sec. 23, T. 7 N., R. 15 E.	23.0	May 15, 1967	1300	.09	214	0	46	24	212	37	445	10.0
04160200	Pine River at M-21 Road	SE $\frac{1}{4}$ sec. 31, T. 7 N., R. 16 E.	33.1	July 31, 1967	1420	5.16	230	3	52	14	269	19	525	7.9
04160300	Cowby Drain at Webb Road	W $\frac{1}{2}$ sec. 4, T. 6 N., R. 15 E.	10.7	July 31, 1967	0910	8.87	310	0	33	25	285	31	535	8.1
04160310	Apple Drain at Goodells Road	NW $\frac{1}{4}$ sec. 14, T. 6 N., R. 15 E.	9.14	Aug. 1, 1967	0810	1.83	250	0	24	24	234	27	480	8.1
04160317	Edgemoor Drain at Goodells Road	SW $\frac{1}{4}$ sec. 11, T. 6 N., R. 15 E.	5.20	July 31, 1967	1745	.76	390	0	23	12	324	4	600	7.9
04160320	Cowby Drain at Castor Road	NW $\frac{1}{4}$ sec. 12, T. 6 N., R. 15 E.	33.4	July 31, 1967	1540	1.39	305	5	42	16	293	39	580	8.4
04160325	Pine River at Dove	NW $\frac{1}{4}$ sec. 21, T. 6 N., R. 16 E.	84.2	July 31, 1967	1425	7.50	276	0	45	24	266	40	580	8.2
04160332	Big Creek at Dove	SW $\frac{1}{4}$ sec. 15, T. 6 N., R. 16 E.	7.32	July 31, 1967	1725	2.85	320	0	28	22	278	16	550	8.0
04160340	Shitka Creek at Mayer Road	NW $\frac{1}{4}$ sec. 30, T. 6 N., R. 16 E.	11.6	Aug. 1, 1967	0810	1.92	226	0	60	27	250	62	535	7.9
04160346	Shitka Creek at Frith Road	NW $\frac{1}{4}$ sec. 8, T. 5 N., R. 16 E.	20.3	Aug. 1, 1967	0755	4.76	203	9	64	18	265	74	580	8.3
04160350	Pine River at U.S. 25	NW $\frac{1}{4}$ sec. 9, T. 5 N., R. 16 E.	135	May 15, 1967	1345	47.6	223	0	52	22	242	59	500	8.2
04160387	Battle Run at Hensen	NW $\frac{1}{4}$ sec. 17, T. 5 N., R. 15 E.	9.25	May 15, 1967	1610	6.86	285	0	30	28	270	36	500	8.2
04160390	Battle Run at Battle Run Road	SW $\frac{1}{4}$ sec. 15, T. 5 N., R. 16 E.	19.8	May 15, 1967	1630	1.07	282	4	57	43	332	118	570	7.9
04160395	Moak Drain at Davis Road	SW $\frac{1}{4}$ sec. 10, T. 5 N., R. 16 E.	3.74	July 31, 1967	1455	2.66	198	3	74	41	252	67	570	8.4
04160398	Pine River at Newman Road	NW $\frac{1}{4}$ sec. 22, T. 5 N., R. 16 E.	---	July 31, 1967	1605	1.39	230	0	63	74	237	102	745	7.9
04160400	Pine River at Vine Road	SW $\frac{1}{4}$ sec. 27, T. 5 N., R. 16 E.	173	July 31, 1967	1345	7.58	293	0	35	20	278	38	570	8.0
							289	0	32	31	275	38	560	8.2
							49.4	224	3	56	244	58	505	8.3
							7.58	293	0	35	278	38	570	8.0

STREAMS IN OAKLAND COUNTY
LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN

On September 12, 1967, a series of water samples was collected at many selected locations within Oakland County as part of a water-resources investigation. In addition, 10 samples were collected with the Oakland County Board of Supervisors. The purpose of the samples is to determine the chemical quality of water during periods of dry-weather streamflow. The results, together with streamflow records, ground-water records, and geologic studies, are intended as a ground-water reconnaissance aid and as an indication of the quality of water of the area. The samples are believed to be unaffected by surface runoff due to recent precipitation and thus represent the chemical quality of water during periods of base flow. The chemical analyses were conducted by field methods.

Chemical analyses in milligrams per liter, September 1967

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Calcium carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness		Specific conductance (micro-mhos at 25°C)	Water temperature (°C)	
											Ca, Mg	Non-carbonate			
04143700	Shawassee River near Davisonburg	N½ sec. 12, T. 4 N., R. 7 E.	11.6	Sept. 12, 1967	1650	3.78	270	0	19	35	241	20	525	8.0	20.5
04143790	Buckhorn Creek at Rose Center	S½ sec. 22, T. 4 N., R. 7 E.	11.9	Sept. 12, 1967	1800	1.27	229	0	23	6.5	198	10	375	8.0	21.0
04143800	Buckhorn Creek near Rose Center	N½ sec. 14, T. 4 N., R. 7 E.	22.0	Sept. 12, 1967	1385	4.28	186	2	27	8.5	172	20	400	8.3	20.0
04143820	Shawassee Tributary at Holly	S½ sec. 3, T. 4 N., R. 7 E.	6.90	Sept. 12, 1967	1515	.011	195	0	54	112	254	94	890	8.0	12.0
04143830	Shawassee River at Holly	S½ sec. 29, T. 5 N., R. 7 E.	49.2	Sept. 12, 1967	1345	12.8	239	10	28	3.7	234	28	530	8.6	18.0
04145920	Holly Branch Flint River near Thomas	N½ sec. 3, T. 5 N., R. 10 E.	11.9	Sept. 12, 1967	1415	.49	280	0	70	12	282	69	585	8.1	14.5
04148010	Kearsley Creek near Oakwood	S½ sec. 10, T. 5 N., R. 9 E.	3.00	Sept. 12, 1967	1300	.005	215	2	42	38	224	51	510	8.3	14.5
04148020	Kearsley Creek near Oakwood	S½ sec. 18, T. 5 N., R. 9 E.	19.7	Sept. 12, 1967	1240	1.94	289	0	25	10	258	21	555	8.2	12.0
04148030	Duck Creek at Ortonville	N½ sec. 18, T. 5 N., R. 9 E.	7.23	Sept. 12, 1967	1320	3.43	163	1	16	16	179	29	520	8.4	11.0
04148200	Swartz Creek near Holly	S½ sec. 15, T. 5 N., R. 7 E.	11.9	Sept. 12, 1967	1220	1.14	317	0	25	13	275	13	535	8.0	10.0
04148210	Swartz Creek near Holly	S½ sec. 7, T. 5 N., R. 7 E.	23.1	Sept. 12, 1967	1100	1.46	171	4	33	14	174	29	455	8.4	15.5
04148215	Swartz Creek Tributary near Holly	S½ sec. 19, T. 5 N., R. 7 E.	2.62	Sept. 12, 1967	1315	.05	283	0	28	20	251	19	520	8.2	19.0
04148250	Swartz Creek near Holly	N½ sec. 6, T. 5 N., R. 7 E.	31.3	Sept. 12, 1967	1005	2.35	266	0	38	18	248	30	500	8.2	13.5
04148400	Thread Creek near Holly	S½ sec. 18, T. 5 N., R. 8 E.	12.2	Sept. 13, 1967	1125	1.29	216	6	24	16	186	9	415	8.5	18.0
04160750	Clinton River at Clarkson	N½ sec. 20, T. 4 N., R. 9 E.	11.5	Sept. 13, 1967	1020	1.28	203	0	43	25	209	43	590	8.2	15.0
04160760	Clinton River at Clarkson	N½ sec. 29, T. 4 N., R. 9 E.	15.0	Sept. 13, 1967	0920	3.71	216	0	39	22	216	39	450	8.2	19.5
04160790	Sashabaw Creek near Eames	N½ sec. 19, T. 4 N., R. 10 E.	9.73	Sept. 13, 1967	1540	1.30	198	0	48	17	217	55	490	8.0	---
04160800	Sashabaw Creek near Eames	S½ sec. 26, T. 4 N., R. 9 E.	21.0	Sept. 13, 1967	1530	1.6	212	0	51	20	231	57	485	8.0	24.5
04160900	Clinton River near Drayton Plains	N½ sec. 21, T. 3 N., R. 9 E.	79.5	Sept. 13, 1967	1010	19.4	211	0	42	35	226	53	510	7.7	---
04160950	Clinton River at Sylvan Lake	S½ sec. 31, T. 3 N., R. 10 E.	107	Sept. 13, 1967	0900	9.99	188	0	42	40	202	48	500	7.8	---
04161000	Clinton River at Sylvan Lake	N½ sec. 36, T. 3 N., R. 10 E.	123	Sept. 13, 1967	1345	44.1	176	0	88	125	288	154	980	7.5	23.0
04161100	Galloway Creek near Auburn Heights	S½ sec. 18, T. 3 N., R. 11 E.	17.8	Sept. 12, 1967	1500	.44	229	0	128	59	335	147	900	8.0	14.0
04161300	Paint Creek near Auburn Heights	N½ sec. 4, T. 4 N., R. 10 E.	18.3	Sept. 12, 1967	1500	2.46	151	2	55	20	193	69	555	8.2	15.0
04161483	Paint Creek at Orton	N½ sec. 3, T. 4 N., R. 10 E.	34.9	Sept. 12, 1967	1550	4.98	221	0	48	17	234	53	485	7.9	18.5
04161500	Paint Creek near Lake Orton	N½ sec. 13, T. 4 N., R. 10 E.	38.9	Sept. 13, 1967	1385	6.48	237	0	38	24	247	53	500	7.8	16.0

LOW-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
STREAMS IN OAKLAND COUNTY

Chemical analyses in milligrams per liter, September 1967—Continued

Station number	Station name	Location	Drain- age area (sq mi)	Date sampled	Time	Dis- charge (cfs)	Bicar- bonate (HCO ₃)	Car- bon- ate (CO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Hardness as CaCO ₃		Specific con- ductance (micro- mhos at 25°C)	Water tem- pera- ture (°C)	pH
											Ca, Mg	Non- car- bon- ate			
04161524	Trot Creek near	SE $\frac{1}{2}$ sec. 19, T. 4 N., R. 10 E.	11.8	Sept. 12	1645	2.39	228	0	24	20	213	26	470	8.2	16.0
04161538	Sargent Creek at Rochester	SW $\frac{1}{4}$ sec. 10, T. 3 N., R. 11 E.	4.69	Sept. 12	1600	.19	201	0	34	113	292	127	840	7.7	17.0
04161540	Prairie Creek at Rochester	SE $\frac{1}{4}$ sec. 10, T. 3 N., R. 11 E.	71.3	Sept. 13	0750	15.6	277	0	39	28	270	43	555	7.9	12.0
04161565	Stony Creek at Lake-	SE $\frac{1}{4}$ sec. 27, T. 5 N., R. 11 E.	--	Sept. 13	1105	0.63	164	3	35	12	162	28	590	8.3	12.0
04161570	Stony Creek near Lakesville	NE $\frac{1}{4}$ sec. 35, T. 5 N., R. 11 E.	16.1	Sept. 13	1040	1.81	210	0	32	16	197	25	540	8.1	13.5
04161580	Romeo	SW $\frac{1}{4}$ sec. 31, T. 5 N., R. 12 E.	25.6	Sept. 13	0915	2.13	190	3	38	16	190	31	540	8.3	12.0
04161770	Twin Lakes Outlet near Washington	SE $\frac{1}{4}$ sec. 25, T. 4 N., R. 11 E.	3.63	Sept. 13	1000	.51	278	0	48	14	278	50	530	8.0	14.0
04161790	Stony Creek near Washington	SW $\frac{1}{4}$ sec. 31, T. 4 N., R. 12 E.	68.0	Sept. 13	0900	35.7	234	0	36	18	236	44	480	7.8	18.0
04161830	Citation River at Red Run near Royal Oak	SE $\frac{1}{4}$ sec. 13, T. 3 N., R. 11 E.	299	Sept. 13	1230	106	234	0	72	70	265	73	720	7.8	18.0
04162000	Big Beaver Creek near Warren	NE $\frac{1}{4}$ sec. 12, T. 1 N., R. 11 E.	36.5	Sept. 12	1015	.20	442	0	134	220	488	126	1900	7.8	17.0
04162900	Glendon Drain near Plum Brook at Utica	SW $\frac{1}{4}$ sec. 33, T. 2 N., R. 12 E.	23.5	Sept. 12	1230	.73	198	2	42	71	182	20	750	8.2	15.5
04163395	East Pond Creek at River Rouge Tributary at Birmingham	NE $\frac{1}{4}$ sec. 13, T. 2 N., R. 11 E.	10.5	Sept. 12	1310	.05	167	0	102	130	294	157	900	8.2	15.5
04163400	Pebble Creek near Southfield	NE $\frac{1}{4}$ sec. 7, T. 2 N., R. 12 E.	16.1	Sept. 12	1340	.17	188	3	152	116	280	126	1070	8.3	18.5
04164090	East Pond Creek at River Rouge Tributary at Birmingham	SW $\frac{1}{4}$ sec. 7, T. 2 N., R. 12 E.	9.49	Sept. 13	0950	.038	204	0	92	17	269	102	680	8.1	14.5
04165990	River Rouge at Birmingham	NE $\frac{1}{4}$ sec. 26, T. 2 N., R. 10 E.	21.5	Sept. 13	0925	1.10	267	0	96	170	389	170	1200	7.8	14.0
04166000	River Rouge at Birmingham	NE $\frac{1}{4}$ sec. 36, T. 2 N., R. 10 E.	36.9	Sept. 13	0800	1.98	239	0	110	145	352	156	1000	7.7	14.5
04166030	Pranklin Branch at Pebble Creek near Southfield	NE $\frac{1}{4}$ sec. 9, T. 1 N., R. 10 E.	15.4	Sept. 13	1050	2.32	188	0	50	50	212	58	685	8.0	13.5
04166090	River Rouge at South- field	NE $\frac{1}{4}$ sec. 30, T. 1 N., R. 10 E.	10.3	Sept. 13	1135	.58	258	4	45	162	280	68	1100	8.3	13.5
04166100	River Rouge at South- field	SW $\frac{1}{4}$ sec. 32, T. 1 N., R. 10 E.	37.9	Sept. 13	1240	5.53	156	0	70	93	223	95	815	8.2	20.5
04166200	Evans Ditch at South- field	SE $\frac{1}{4}$ sec. 28, T. 1 N., R. 10 E.	9.48	Sept. 13	1415	1.32	302	15	58	101	384	136	1000	8.6	15.5
04166290	Minnow Pond Drain at Quakertown	SW $\frac{1}{4}$ sec. 15, T. 1 N., R. 9 E.	9.18	Sept. 12	1550	.26	174	0	64	216	292	149	1300	8.1	15.5
04166300	Walleye Branch at Paramount	NE $\frac{1}{4}$ sec. 27, T. 1 N., R. 9 E.	17.5	Sept. 12	1455	1.12	185	0	39	34	192	40	595	8.2	17.0
04166595	Walleye Branch at Novi	NE $\frac{1}{4}$ sec. 22, T. 1 N., R. 8 E.	10.6	Sept. 12	--	.02	413	4	48	218	404	66	1440	8.2	16.5
04166600	Walleye Branch at Northville	SW $\frac{1}{4}$ sec. 35, T. 1 N., R. 8 E.	22.1	Sept. 12	1325	.81	246	0	56	26	248	46	660	7.9	16.0

04168800	Huron River near Andersonville	SE $\frac{1}{4}$ sec. 3, T. 3 N., R. 8 E.	14.0	Sept. 13	0815	.34	210	3	23	5.0	184	12	540	8.3	10.5
04168900	Huron River near Andersonville	SE $\frac{1}{4}$ sec. 13, T. 3 N., R. 8 E.	20.8	Sept. 13	1130	.16	193	0	21	12	177	19	375	7.8	--
04168910	Huron River near Oxbow	E $\frac{1}{2}$ sec. 27, T. 3 N., R. 8 E.	27.6	Sept. 13	1245	5.45	205	0	30	22	196	28	435	8.0	--
04169000	Hayes Creek at Commerce	W $\frac{1}{2}$ sec. 11, T. 2 N., R. 8 E.	7.58	Sept. 12	1625	3.82	145	2	32	36	159	40	540	8.3	--
04169500	Huron River near Commerce	SE $\frac{1}{4}$ sec. 10, T. 2 N., R. 8 E.	49.6	Sept. 12	1520	12.7	149	3	29	25	162	38	480	8.3	--
04169505	Huron River near Milford	W $\frac{1}{2}$ sec. 18, T. 2 N., R. 8 E.	77.4	Sept. 12	1305	19.2	213	1	28	24	209	34	445	8.2	--
04169700	Norton Creek near Milford	NE $\frac{1}{4}$ sec. 25, T. 2 N., R. 7 E.	17.9	Sept. 11	1415	11.5	276	0	53	22	262	38	560	8.1	--
04169850	Pettibone Creek at Milford	NE $\frac{1}{4}$ sec. 10, T. 2 N., R. 7 E.	18.0	Sept. 12	1105	3.87	199	0	22	20	186	23	385	8.0	--
04170000	Huron River at Milford	SE $\frac{1}{4}$ sec. 9, T. 2 N., R. 7 E.	125	Sept. 12	1000	41.4	237	3	34	28	224	30	500	8.3	--
04170500	Huron River near New Hudson	NE $\frac{1}{4}$ sec. 1, T. 1 N., R. 6 E.	143	Sept. 12	0840	43.3	179	0	30	27	177	30	405	8.1	18.5
04170795	Davis Creek near New Hudson	SE $\frac{1}{4}$ sec. 16, T. 1 N., R. 7 E.	15.6	Sept. 12	--	.03	286	0	160	16	380	162	775	7.8	10.0
04170800	Davis Creek near South Lyon	NE $\frac{1}{4}$ sec. 18, T. 1 N., R. 7 E.	24.4	Sept. 12	1015	.77	154	0	168	19	300	174	830	7.9	11.0

EXTREME-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN

The series of water samples were collected at many gaging stations throughout the State of Michigan under spring high-flow and summer low-flow conditions. The purpose of the sampling is to determine the chemical quality of stream water under extreme flow conditions on a statewide basis. The chemical analyses were conducted by field methods except as noted.

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Carbonyl sulfide (CS ₂)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance (micro-mhos/cm at 25°C)	pH	Water temperature (°C)
											Ca	Mg			
Chemical analyses in milligrams per liter, March to September, 1967															
STREAMS TRIBUTARY TO LAKE SUPERIOR															
04031000	Black River near Bessemer	SE 1/4 sec. 32, T. 48 N., R. 46 W.	200	Apr. 1, 1967	1030	3000	20	0	3.0	2.0	2.0	4	55	7.4	0.5
04031500	Presque Isle River at Marquette	NW 1/4 sec. 21, T. 46 N., R. 43 W.	171	Sept. 11, 1950	0850	50.7	56	0	2.0	5.0	2.0	8	105	7.4	15.5
04032000	Presque Isle River near Tula	NW 1/4 sec. 23, T. 48 N., R. 44 W.	261	Sept. 8, 1950	1220	85.5	26	0	2.0	1.0	3.0	2	60	7.3	1.5
04033000	Middle Branch Ontonagon River near Middle Branch Ontonagon River near	NW 1/4 sec. 29, T. 46 N., R. 38 W.	164	Apr. 2, 1950	1015	1730	54	0	10	2.0	4.0	6	80	7.1	18.5
04034500	Middle Branch Ontonagon River near Trout Creek	NW 1/4 sec. 29, T. 46 N., R. 38 W.	164	Apr. 2, 1950	1015	117	56	0	1.0	2.0	5.0	4	100	7.3	17.5
04035000	East Branch Ontonagon River near Middle Branch Ontonagon River near	SW 1/4 sec. 8, T. 47 N., R. 38 W.	203	Sept. 7, 1950	1110	396	38	0	4.0	2.0	2.0	2	150	7.5	3.5
04035500	East Branch Ontonagon River near Middle Branch Ontonagon River near	NW 1/4 sec. 3, T. 50 N., R. 38 W.	272	Sept. 7, 1950	2015	43.5	76	0	7.0	2.0	6.0	1	125	7.3	15.5
04036000	West Branch Ontonagon River near Middle Branch Ontonagon River near	NE 1/4 sec. 3, T. 48 N., R. 42 W.	162	Apr. 10, 1950	1230	283	83	0	4.5	2.0	6.0	0	135	7.5	0
04037500	Lake Outlet at Clisco	NE 1/4 sec. 27, T. 50 N., R. 39 W.	671	Mar. 31, 1950	1535	9190	104	0	11	2.0	8.0	0	160	7.8	0
04039500	South Branch Ontonagon River near Ontonagon River near	E 1/2 sec. 32, T. 45 N., R. 41 W.	50.7	Apr. 11, 1950	1110	139	27	0	17	4.0	2.0	4	80	7.8	19.5
04040000	Sturgeon River near Otter River near Eto	NW 1/4 sec. 26, T. 48 N., R. 40 W.	348	Aug. 2, 1950	0955	12.2	62	0	5.0	2.0	4.6	0	100	7.7	4.5
04041500	Sturgeon River near Otter River near Eto	NE 1/4 sec. 20, T. 50 N., R. 39 W.	1340	Mar. 31, 1950	1430	1690	88	0	7.0	4.0	4.0	0	85	7.4	21.5
04042500	Sturgeon River near Otter River near Eto	SE 1/4 sec. 15, T. 50 N., R. 35 W.	346	Aug. 21, 1950	1515	650	51	0	6.5	2.0	4.2	0	120	7.5	5.0
04043000	Sturgeon River near Arnhem	NE 1/4 sec. 8, T. 51 N., R. 34 W.	162	Aug. 21, 1950	1600	84.2	112	0	1.0	2.0	4.0	4	120	7.5	16.5
04044000	Cherry Creek near Harve	SE 1/4 sec. 1, T. 52 N., R. 34 W.	705	Apr. 4, 1950	1030	401	76	0	29.0	4.5	8.4	13	172	8.0	11.0
04044583	Cherry Creek near Harve	SE 1/4 sec. 29, T. 48 N., R. 26 W.	51.4	Aug. 16, 1950	1625	35.7	98	0	5.0	3.0	6.0	0	80	7.3	16.5
04045500	Tahquamenon River near Paradise	SE 1/4 sec. 13, T. 47 N., R. 25 W.	4.53	Aug. 16, 1950	1800	18.2	107	0	6.0	4.0	9.2	4	180	7.7	9.5
04046000	Black River near Manistique River	NE 1/4 sec. 11, T. 48 N., R. 8 W.	790	Sept. 7, 1950	1300	293	105	0	14	3.0	9.8	12	190	7.3	19.5
STREAMS TRIBUTARY TO LAKE MICHIGAN															
04049500	Manistique River near Manistique River near	SE 1/4 sec. 13, T. 43 N., R. 9 W.	28	Aug. 15, 1945	1645	9.74	161	0	4.0	2.0	134	2	245	8.2	15.5
04055000	Manistique River near Manistique River near	SE 1/4 sec. 4, T. 44 N., R. 13 W.	341	Apr. 3, 1950	754	207	33	0	12	1.0	33	7	75	7.5	18.0
04056500	Manistique River near Manistique River near	SE 1/4 sec. 26, T. 43 N., R. 14 W.	704	Apr. 5, 1950	4150	29	0	0	9.0	1.0	66	8	130	7.1	18.0
04057000	Manistique River near Manistique River near	SE 1/4 sec. 15, T. 42 N., R. 15 W.	1100	Aug. 16, 1950	1400	319	28	0	6.0	2.0	20	5	60	7.5	5.0
04057500	Manistique River near Manistique River near	SE 1/4 sec. 15, T. 42 N., R. 15 W.	1100	Aug. 16, 1950	1400	319	28	0	18.5	2.0	70	6	140	7.5	21.0
04057600	Indian River near Indian River near	NE 1/4 sec. 34, T. 42 N., R. 16 W.	302	Apr. 22, 1950	1030	847	79	0	8.0	2.0	77	7	150	7.6	20.5
04057700	Indian River near Indian River near	NE 1/4 sec. 34, T. 42 N., R. 16 W.	302	Apr. 22, 1950	1030	847	79	0	19	2.0	82	17	170	7.8	2.0

EXTREMELY FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN

Station No.	Location	Aug. 16	1850	356	107	0	48	2.0	132	44	255	7.8	24.5
04057510	Manistique Sturgeon River near Hume Junction	SF ² sec. 17, T. 41 N., R. 19 W.	Aug. 18 1245	87.7	107	0	9.9	2.0	97	9	185	8.2	19.0
04057800	Michigan Escanaba River at Humbolt	SF ² sec. 1, T. 47 N., R. 29 W.	Aug. 18 1030	346	20	0	8.0	1.0	15	0	50	7.4	1.0
04057900	Black River near Republic	NE ² sec. 2, T. 46 N., R. 29 W.	Aug. 4 1000	156	15	0	6.0	4.0	20	8	55	7.1	1.0
04058000	Middle Branch Escanaba River near Espenbank	SF ² sec. 12, T. 46 N., R. 28 W.	Aug. 7 1430	824	51	0	11	6.0	58	16	130	7.0	20.5
04058100	Middle Branch Escanaba River near Princeton	NW ² sec. 12, T. 45 N., R. 26 W.	Aug. 16 1305	41.2	42	0	7.0	4.0	40	6	80	7.3	19.5
04058200	Schwartz Creek near Palmer	SF ² sec. 1, T. 46 N., R. 27 W.	Aug. 14 1750	970	23	0	9.0	2.0	18	0	50	7.6	.5
04058300	Warner Creek near Palmer	NW ² sec. 10, T. 46 N., R. 25 W.	Aug. 16 0915	5.71	83	0	4.0	4.0	70	12	140	7.4	12.0
04058400	Goose Lake Outlet East Branch Escanaba River at Gwin	SF ² sec. 12, T. 46 N., R. 26 W.	Aug. 15 1815	4.48	112	0	22	12	102	10	230	7.4	19.5
04058500	East Branch Escanaba River at Gwin	NE ² sec. 21, T. 45 N., R. 25 W.	Aug. 3 1120	723	5	0	75	9.0	31	31	310	7.4	3.5
04059000	Escanaba River at Cornell	SF ² sec. 32, T. 41 N., R. 23 W.	Aug. 13 1200	3780	74	0	19	13	18	18	168	7.5	3.0
04059500	Ford River near Hyde	NW ² sec. 19, T. 39 N., R. 23 W.	Aug. 24 2234	449	105	0	8.5	4.0	92	6	190	7.6	20.0
04060500	Iron River at Caspian	SF ² sec. 1, T. 42 N., R. 35 W.	Aug. 24 1425	284	207	4	10	3.0	180	66	320	8.5	21.0
04061000	Brule River near Paint River at	SF ² sec. 11, T. 41 N., R. 32 W.	Sept. 8 1515	61.6	137	0	210	15	316	204	580	7.8	15.5
04061500	Paint River near Crystal Falls	SF ² sec. 20, T. 43 N., R. 32 W.	Aug. 2 1510	1620	148	0	22	1.0	50	21	140	7.4	1.5
04062000	Paint River near Alpha	NW ² sec. 25, T. 42 N., R. 32 W.	Aug. 11 1200	4270	28	0	5.0	1.0	122	41	285	7.5	2.0
04062200	Peshoke River near Michigan	NW ² sec. 13, T. 48 N., R. 30 W.	Aug. 17 1535	22.0	29	0	4.0	2.0	26	2	50	6.9	21.0
04062270	Michigan River near Champion	NW ² sec. 27, T. 47 N., R. 30 W.	Aug. 18 1450	44.9	10	0	4.0	1.0	10	2	50	7.2	1.0
04062300	Michigan River at Republic	NE ² sec. 18, T. 46 N., R. 29 W.	Aug. 18 1730	148	17	0	7.0	3.0	23	9	50	7.0	20.0
04062400	Michigan River near Witch Lake	NW ² sec. 1, T. 44 N., R. 30 W.	Apr. 18 1300	2860	49	0	12	2.0	20	4	50	7.7	4.5
04062500	Michigan River near Crystal Falls	NW ² sec. 20, T. 43 N., R. 31 W.	Aug. 18 1800	180	49	0	5.0	4.0	46	6	95	7.5	19.0
04063000	Monominee River near Florence, Wis.	NE ² sec. 16, T. 41 N., R. 31 W.	Aug. 31 1830	618	31	0	8.0	2.0	49	7	100	7.2	18.5
04063500	West Branch Sturgeon River near Humbolt	NE ² sec. 30, T. 42 N., R. 29 W.	Aug. 31 0820	545	117	0	36	6.0	128	32	250	8.2	16.0
04064000	Sturgeon River near Foster City	NW ² sec. 36, T. 41 N., R. 28 W.	Apr. 25 1350	112.4	217	0	8.5	3.0	60	11	140	7.8	1.0
04064500	St. Joseph River near Coldwater	SF ² sec. 20, T. 4 S., R. 6 W.	Apr. 7 1700	685	229	0	8.5	3.0	184	6	340	7.8	20.0
04064600	Coldwater River near Hoback	NW ² sec. 22, T. 5 S., R. 7 W.	Apr. 8 1450	93.5	212	3	65	13	247	70	560	8.4	17.0
04069000	Athens Creek near Kittens	NW ² sec. 12, T. 5 S., R. 9 W.	Mar. 27 1145	284	202	0	70	16	238	68	485	7.5	20.0
04069700	Portage River near Fulton	SF ² sec. 29, T. 4 S., R. 9 W.	Mar. 14 0940	6.59	278	0	54	10	278	54	515	8.2	11.0
04097170	Portage River near Yickburg	SF ² sec. 16, T. 4 S., R. 10 W.	Apr. 16 1120	93	124	0	92	7.0	260	32	480	7.8	13.5
04097200	Goodneck Creek near Schoolcraft	NE ² sec. 5, T. 4 S., R. 11 W.	Apr. 12 1345	10.9	186	3	58	8.0	210	46	405	8.4	20.5
			Aug. 13 1345	4.34	213	0	18	3.0	189	18	370	9.4	25.5
			Aug. 15 1345	4.34	240	0	18	3.0	189	18	395	7.8	

A Laboratory analysis.

EXTREME-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
Chemical analyses in milligrams per liter, March to September 1967--Continued

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Calcium carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Ca, Mg	Hardness as CaCO ₃ Non-bonate	Specific conductance (micro-mhos at 25°C)	pH	Water temperature (°C)
04097500	St. Joseph River at Three Rivers	S½ sec. 18, T. 6 S., R. 11 W.	1350	Apr. 8, 1967	1200	3500	223	3	35	5.0	220	34	390	8.4	--
04087540	Prairie River near Nottawa	SW¼ sec. 6, T. 7 S., R. 9 W.	106	Aug. 15, 1967	1325	642	217	0	35	8.0	212	34	405	7.8	22.0
04098500	Prairie River near White Pigeon	SW¼ sec. 10, T. 8 S., R. 11 W.	192	Apr. 14, 1967	1535	21.4	205	4	90	13	276	104	520	8.5	--
04099000	St. Joseph River at Motville	SW¼ sec. 6, T. 8 S., R. 12 W.	1066	Apr. 15, 1967	1130	65.4	248	0	78	10	258	68	475	8.1	23.5
04101500	St. Joseph River at Mistic River at Summerville	SW¼ sec. 28, T. 7 S., R. 17 W.	3686	Aug. 15, 1967	1230	4310	207	4	55	9.0	236	62	445	8.5	--
04101800	Paw Paw River at Riverside	SW¼ sec. 30, T. 6 S., R. 16 W.	255	Aug. 16, 1967	1355	138	268	0	38	8.0	202	16	465	7.9	18.5
04102500	Hills River near Kalamazoo River near Battle Creek	SW¼ sec. 26, T. 3 S., R. 18 W.	390	Apr. 11, 1967	--	884	200	0	38	10	201	37	370	8.2	--
04102700	Augusta Creek near Galesburg	NE¼ sec. 28, T. 1 S., R. 16 W.	83.6	Aug. 17, 1967	1215	26.1	288	0	23	32	230	30	450	8.5	--
04105500	Augusta Creek near Kalamazoo River near Battle Creek	SW¼ sec. 1, T. 2 S., R. 8 W.	824	May 13, 1967	1205	742	272	0	55	18	287	64	580	8.1	--
04105700	Augusta Creek near Galesburg	SW¼ sec. 27, T. 1 S., R. 9 W.	38.9	Mar. 14, 1967	1400	64.0	183	2	3.0	22	208	56	380	8.3	2.0
04105800	Kalamazoo River at Portage Creek near Portage Creek near Kalamazoo	NE¼ sec. 7, T. 2 S., R. 9 W.	38.1	Mar. 14, 1967	1345	42	219	3	21	4.0	196	14	370	8.4	3.0
04106100	West Fork Portage Creek near Kalamazoo	NE¼ sec. 19, T. 2 S., R. 10 W.	1010	Apr. 8, 1967	1440	1930	212	0	74	12	249	75	460	8.0	--
04106400	Kalamazoo River near Fenville	NE¼ sec. 15, T. 3 S., R. 11 W.	18.6	Mar. 27, 1967	1400	40	164	3	31	7.0	163	26	320	8.5	--
04108500	Rabbit River near Hopkins	NE¼ sec. 34, T. 2 S., R. 11 W.	22.4	Mar. 28, 1967	1245	54	220	0	37	28	224	44	480	8.1	6.0
04108800	Grand River near Jackson	NE¼ sec. 5, T. 3 S., R. 11 W.	18.7	Mar. 18, 1967	1235	13	297	0	22	8.0	207	21	400	8.2	3.5
04109000	Grand River near Dear Creek near Danville	NE¼ sec. 5, T. 2 N., R. 14 W.	1600	Apr. 12, 1967	1755	3030	223	0	68	16	232	69	495	8.7	--
04109800	Grand River near Lookingias River	NE¼ sec. 2, T. 2 N., R. 14 W.	1600	Apr. 17, 1967	1600	795	254	0	75	54	267	59	575	7.6	--
04109800	Grand River near Lookingias River	SW¼ sec. 16, T. 3 N., R. 12 W.	71.4	Mar. 28, 1967	1550	195	185	2	40	13	164	46	360	8.3	8.5
04109800	Grand River near Lookingias River	SW¼ sec. 31, T. 5 N., R. 14 W.	65.8	Apr. 17, 1967	1435	14.1	241	4	46	10	242	40	465	8.5	23.5
04109800	Grand River near Lookingias River	SW¼ sec. 31, T. 5 N., R. 14 W.	65.8	Apr. 18, 1967	0940	3.94	186	0	58	66	238	62	380	8.6	20.5
04109800	Grand River near Lookingias River	Sec. 22, T. 2 S., R. 1 W.	174	Apr. 6, 1967	1540	325	186	3	128	72	347	146	800	8.4	--
04110000	Grand River near Lookingias River	NE¼ sec. 26, T. 2 N., R. 3 W.	661	Apr. 6, 1967	1800	1400	201	3	94	19	278	111	530	8.4	--
04111500	Grand River near Lookingias River	E¼ sec. 33, T. 3 N., R. 1 E.	16.3	Apr. 5, 1967	1450	23	242	0	76	14	297	99	540	8.2	--
04112000	Grand River near Lookingias River	E¼ sec. 1, T. 3 N., R. 1 W.	9.34	Apr. 5, 1967	1550	10.4	239	3	58	18	286	88	520	8.3	--
04113000	Grand River near Lookingias River	NE¼ sec. 9, T. 4 N., R. 2 W.	1230	Apr. 5, 1967	1035	2850	208	3	80	20	280	107	530	8.4	--
04114000	Grand River near Lookingias River	NE¼ sec. 4, T. 5 N., R. 5 W.	1385	Mar. 31, 1967	1600	2360	211	0	104	22	288	125	575	8.1	12.0
04114500	Grand River near Lookingias River	Sec. 10, T. 5 N., R. 4 W.	281	Mar. 31, 1967	1530	673	187	0	87	12	252	99	465	8.0	--
04115000	Grand River near Lookingias River	Sec. 5, T. 8 N., R. 3 W.	434	Apr. 15, 1967	1050	629	176	0	45	12	212	68	400	7.9	--
04116000	Grand River at Ionia Rapids	NE¼ sec. 30, T. 7 N., R. 6 W.	2840	Apr. 15, 1967	1025	4180	190	4	96	21	290	98	545	8.4	--
04118500	Grand River near Rockford	NE¼ sec. 15, T. 8 N., R. 11 W.	234	Apr. 13, 1967	1450	1350	150	0	63	15	234	68	395	8.2	--
04118500	Grand River near Rockford	NE¼ sec. 15, T. 8 N., R. 11 W.	234	Apr. 16, 1967	1305	169	217	0	59	24	234	56	500	7.5	--

STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued

	NET sec. 25, T. 7 N., R. 12 W.	4900	1055	1100	234	0	54	30	244	52	510	7.8	23.5	
04119000	Grand River at Grand Rapids	NET sec. 2, T. 22 N., R. 5 W.	309	1020	882	60	0	14	4.0	58	9	130	7.9	2.0
04121000	Muskegon River near Maritz	NET sec. 3 T. 17 N., R. 8 W.	1450	1187	3550	94	0	13	7.0	87	10	200	8.1	1.5
04121500	Muskegon River at Little Muskegon River near Morley	NET sec. 24, T. 13 N., R. 9 W.	138	1600	521	94	0	13	2.0	84	7	185	7.9	1.0
04122000	Muskegon River at Newry	NET sec. 24, T. 12 N., R. 13 W.	2350	1600	59.9	202	0	12	6.0	176	10	320	7.7	24.0
04122100	Boonville near Muskegon	NET sec. 4, T. 10 N., R. 16 W.	14.8	6810	5800	144	2	27	18	152	30	333	8.3	4.5
04122200	White River near Whitehall	NET sec. 4, T. 10 N., R. 16 W.	14.8	6800	1890	110	0	15	16	152	15	293	7.6	21.0
04122300	White River near Whitehall	NET sec. 4, T. 10 N., R. 16 W.	14.8	6800	4.68	110	0	17	28	112	22	275	7.6	17.0
04123000	Big Sable River near Manistee	NET sec. 24, T. 20 N., R. 17 W.	127	1340	476	183	0	22	25	174	24	360	7.8	20.5
04123500	Manistee River near Grayling	NET sec. 31, T. 27 N., R. 4 W.	159	1915	281	157	0	16	7.0	90	21	352	7.8	3.5
04124000	Manistee River near Sherman	NET sec. 36, T. 24 N., R. 12 W.	900	1915	281	157	0	16	7.0	90	21	352	7.8	3.5
04125000	Plymouth near Sherman	NET sec. 20, T. 21 N., R. 12 W.	251	1200	184	180	0	6.0	5.0	142	0	260	7.9	7.0
04126000	Manistee River near Boylston	NET sec. 36, T. 22 N., R. 16 W.	1780	1435	2200	117	0	12	2.0	106	10	270	8.2	15.5
04126200	Little Manistee near Boylston	NET sec. 36, T. 22 N., R. 16 W.	1780	1435	2200	117	0	12	2.0	106	10	270	8.2	15.5
04127000	Bayfield near Boylston	NET sec. 31, T. 21 N., R. 15 W.	200	1225	425	194	0	11	3.0	88	11	165	8.1	3.5
04127800	Jordan River near East Jordan	NET sec. 21, T. 26 N., R. 10 W.	223	1140	422	108	0	14	2.0	102	14	194	8.1	5.0
		NET sec. 7, T. 31 N., R. 6 W.	67.6	1140	186	171	2	8.0	4.0	142	0	262	8.3	18.0
				1730	416	146	2	14	2.0	130	9	280	8.4	3.5
				1110	169	185	0	9.0	4.0	152	0	295	8.0	13.5

STREAMS TRIBUTARY TO LAKE HURON

	NET sec. 38, T. 34 N., R. 3 W.	170	1055 <th>422 <th>176</th> <th>0</th> <th>17</th> <th>3.0</th> <th>152</th> <th>8</th> <th>300</th> <th>8.2</th> <th>1.0</th> </th>	422 <th>176</th> <th>0</th> <th>17</th> <th>3.0</th> <th>152</th> <th>8</th> <th>300</th> <th>8.2</th> <th>1.0</th>	176	0	17	3.0	152	8	300	8.2	1.0	
04028000	Sturgeon River near Wolverine	NET sec. 9, T. 32 N., R. 1 W.	63	422	205	168	0	10	4.0	144	6	265	7.9	15.0
04129000	Pigeon River at Pigeon River	NET sec. 2, T. 34 N., R. 2 W.	159	1330	118	171	0	13	4.0	142	10	270	8.2	3.5
04130000	Cheboygan River near Cheboygan	NET sec. 19, T. 37 N., R. 1 W.	865	1400	61.5	143	2	13	5.0	128	9	255	8.3	5.0
04130500	Black River near Hillman	NET sec. 29, T. 35 N., R. 1 E.	313	1030	1440	166	2	13	2.0	143	5	280	8.3	3.5
04131500	Bainy River near Ocqueoc	NET sec. 22, T. 35 N., R. 2 E.	85	1520	1270	150	0	13	2.0	128	5	265	8.1	3.5
04132500	Thunder Bay River near Bolton	NET sec. 8, T. 30 N., R. 4 E.	232	1330	493	129	0	15	2.0	118	12	235	8.1	1.5
04133500	Thunder Bay River near Bolton	NET sec. 8, T. 30 N., R. 4 E.	232	1330	493	129	0	15	2.0	118	12	235	8.1	1.5
04134000	North Branch Thunder Bay near Bolton	NET sec. 36, T. 32 N., R. 7 E.	184	1450	8.36	241	0	3.0	2.0	202	4	340	8.0	17.0
04135000	Au Sable River at Au Sable River	NET sec. 7, T. 26 N., R. 3 W.	110	1030	767	159	2	12	3.0	142	9	280	8.4	2.0
04135500	Au Sable River at Au Sable River	NET sec. 7, T. 26 N., R. 3 W.	110	1030	767	159	2	12	3.0	142	9	280	8.4	2.0
04136000	East Branch Au Gres River at McIvor	NET sec. 10, T. 21 N., R. 6 E.	84	1530	175	106	0	14	1.0	102	14	199	8.1	4.5
04136500	Au Gres River near Houghton Creek	NET sec. 32, T. 21 N., R. 6 E.	169	1340	2440	122	0	11	9.0	104	4	230	8.2	3.5
04139000	Houghton Creek near Lupton	NET sec. 10, T. 21 N., R. 6 E.	84	1020	830	171	2	8.0	5.0	140	0	265	8.4	20.5
04139500	Rifle River at "The Ranch" near Lupton	NET sec. 11, T. 23 N., R. 3 E.	54	1615	400	92	0	20	1.0	96	20	198	7.8	4.0
04140000	Skilack near Skilack	NET sec. 33, T. 23 N., R. 3 E.	19	1015	37.4	176	0	24	5.0	158	26	300	7.3	16.5
04140500	Rifle River at Skilack	NET sec. 9, T. 22 N., R. 3 E.	110	1015	169.8	196	0	89	2.0	230	68	440	8.0	20.0
				169.8	169.8	149	2	24	4.0	150	24	269	8.3	8.5
				36.2	36.2	212	0	17	6.0	184	10	345	8.0	13.5
				282	282	158	0	32	2.0	162	32	308	7.7	8.5
				161.1	161.1	103	0	32	4.0	116	31	248	7.6	14.1
				6.96	6.96	198	0	10	4.0	162	0	305	8.2	16.5
				773	773	140	0	29	2.0	141	26	340	8.0	2.0
				1230	1230	200	0	23	5.6	180	16	380	8.0	18.0

A Laboratory analysis.

EXTREME-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
Chemical analyses in milligrams per liter, March to September 1967--Continued

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Carb- bon- ate (CO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Hardness as CaCO ₃ Ca, Mg	Specific con- ductance (micro- mhos at 25°C)	pH	Water tem- per- ature (°C)	
STREAMS TRIBUTARY TO LAKE HURON--Continued															
04141000	South Branch Shepard Creek near Siskirk	Sec. 8, T. 22 N., R. 3 E.		1.26 Apr. 6 1967 A	0645	17.5	98	0	30	5.0	114	34	240	8.0	3.5
04142000	Rifle River near Sterling	Sec. 5, T. 19 N., R. 4 E.	320	Aug. 2	1450	0.033	238	3	42	4.0	23	33	410	8.3	21.5
04143000	Norling Kaskawilum near Kaskawilum	Sec. 27, T. 15 N., R. 4 E.	101	Mar. 28A	1250	897	239	0	11	12	118	44	284	7.9	1.0
04144000	Shawassee River at Byron	Sec. 23, T. 5 N., R. 4 E.	368	Mar. 27	1155	809	215	5	74	18	240	88	469	8.4	--
04144500	Shawassee River at Shawansee	Sec. 12, T. 7 N., R. 2 E.	538	Aug. 10	0945	57.4	272	8	35	34	267	35	570	8.7	20.5
04145000	Shawassee River at Fergus	Sec. 22, T. 10 N., R. 3 E.	637	Mar. 28A	1135	1280	273	7	49	19	286	58	600	8.2	6.5
04146000	Farmers Creek near Fergus	Sec. 6, T. 7 N., R. 10 E.	57	Mar. 28	1245	2140	162	0	69	17	223	90	435	8.2	--
04147000	Lapeer near Otisville	Sec. 9, T. 8 N., R. 8 E.	547	Aug. 7	1350	86.6	295	0	57	40	290	48	640	7.8	--
04148140	Kearsley Creek near Davison	Sec. 12, T. 7 N., R. 7 E.	98.8	Aug. 8	1030	9.7	329	0	66	12	215	74	420	8.3	2.0
04148200	Swartz Creek near Flint	Sec. 15, T. 5 N., R. 7 E.	927	Aug. 9	1050	165.9	272	0	83	17	200	38	405	8.9	10.5
04148000	Flint River near Foster	Sec. 9, T. 8 N., R. 8 E.	1120	Aug. 8	0720	76.9	287	4	63	20	288	64	540	8.4	--
04150000	South Branch Cass River near Cass City	Sec. 12, T. 7 N., R. 7 E.	11.9	Mar. 27	1615	338	160	0	66	22	218	88	450	7.9	5.5
04151000	Flint River near South Branch Cass	Sec. 4, T. 7 N., R. 6 E.	927	Mar. 27	1335	37.8	173	4	43	30	272	42	540	8.4	--
04151500	Flint River near South Branch Cass	Sec. 15, T. 5 N., R. 7 E.	927	Mar. 27	1355	2.37	272	2	37	13	257	28	420	8.4	4.5
04152000	Flint River near South Branch Cass	Sec. 4, T. 7 N., R. 6 E.	927	Mar. 27	1355	2.37	168	0	65	54	211	73	430	8.4	10.0
04153000	Flint River near South Branch Cass	Sec. 6, T. 10 N., R. 5 E.	1120	Mar. 28	1800	126	183	0	93	94	254	104	810	7.7	--
04153500	Flint River near South Branch Cass	Sec. 7, T. 13 N., R. 12 E.	251	Aug. 15	1605	131	256	0	79	30	244	102	500	7.9	--
04154000	Flint River near South Branch Cass	Sec. 7, T. 13 N., R. 12 E.	251	Aug. 15	1605	131	256	0	79	30	244	102	500	7.9	--
04154500	Flint River near South Branch Cass	Sec. 7, T. 13 N., R. 12 E.	251	Aug. 15	1605	131	256	0	79	30	244	102	500	7.9	--
04155000	Flint River near South Branch Cass	Sec. 4, T. 13 N., R. 11 E.	370	Mar. 28	1315	8050	109	0	38	6.0	135	46	290	7.8	1.0
04155500	Flint River near South Branch Cass	Sec. 7, T. 11 N., R. 8 E.	700	Apr. 11A	0840	1390	146	0	84	14	230	111	448	7.7	6.5
04156000	Flint River near South Branch Cass	Sec. 27, T. 11 N., R. 6 E.	848	Mar. 29	1040	10600	110	0	42	8.0	144	54	310	7.8	1.5
04156500	Flint River near South Branch Cass	Sec. 7, T. 17 N., R. 1 W.	487	Aug. 10	0900	220	224	0	38	12	212	28	405	8.1	21.0
04157000	Flint River near South Branch Cass	Sec. 7, T. 15 N., R. 1 W.	138	Mar. 28A	0905	1650	94	0	36	16	135	54	316	8.0	2.0
04157500	Flint River near South Branch Cass	Sec. 20, T. 14 N., R. 3 W.	416	Mar. 27	1320	1320	148	0	13	215	158	37	340	8.0	4.0
04158000	Flint River near South Branch Cass	Sec. 8, T. 14 N., R. 3 W.	416	Aug. 9	1005	187	237	0	35	28	234	40	460	8.2	23.0
04158500	Flint River near South Branch Cass	Sec. 24, T. 14 N., R. 1 W.	597	Mar. 28A	1100	3050	118	0	37	18	152	56	336	8.2	3.5
04159000	Flint River near South Branch Cass	Sec. 34, T. 12 N., R. 3 W.	288	Aug. 8	0900	211	222	4	37	36	230	44	475	8.4	20.5
04159500	Flint River near South Branch Cass	Sec. 4, T. 13 N., R. 1 E.	390	Aug. 7	0940	173	256	0	41	33	262	52	510	7.6	23.0
04160000	Flint River near South Branch Cass	Sec. 4, T. 13 N., R. 1 E.	390	Mar. 28A	1045	1700	120	0	42	74	215	117	551	7.6	5.0
04160500	Flint River near South Branch Cass	Sec. 28, T. 14 N., R. 2 E.	2400	Mar. 28A	1210	14300	180	0	55	801	920	772	2300	7.6	24.5
04161000	Flint River near South Branch Cass	Sec. 24, T. 12 N., R. 4 E.	6060	Mar. 28A	1330	26200	127	0	42	308	255	153	644	8.1	30.0
04161500	Flint River near South Branch Cass	Sec. 24, T. 12 N., R. 4 E.	6060	Mar. 28A	1330	26200	127	0	42	308	255	153	644	8.1	30.0
04162000	Flint River near South Branch Cass	Sec. 36, T. 16 N., R. 10 E.	55	Mar. 27	1330	1670	90	0	32	6.5	114	40	249	8.1	8.0
04162500	Flint River near South Branch Cass	Sec. 36, T. 16 N., R. 10 E.	55	Mar. 27	1330	1670	200	0	115	14	266	102	490	8.2	19.5
STREAMS TRIBUTARY TO ST. CLAIR RIVER															
04159500	Black River near Fair	Sec. 32, T. 8 N., R. 16 E.	480	Mar. 28	1215	7030	137	0	26	15	140	28	300	8.2	--
				Aug. 9	0955	80.8	276	0	110	84	329	103	780	8.0	--

Station No.	Location	Date	Time	Stage	STREAMS TRIBUTARY TO LAKE ST. CLAIR										
					0	67	12	152	82	330	8.0	8.0	3.5		
04158900	Mill Creek near Avoca	Mar. 28	169	0920	1880	85	0	67	12	152	82	330	8.0	8.0	3.5
04160570	North Branch Belle River at Bay City	Mar. 28	18.0	0910	13.8	256	0	210	60	382	172	850	7.8	7.8	5.0
04160600	Belle River at Memphis	Mar. 28	151	1445	9.7	62	0	136	25	228	177	850	7.0	7.0	1.0
		Apr. 20	151	1300	9.7	157	0	128	30	282	153	530	8.2	8.2	5.0
		Aug. 9	125.5	1255	15.2	317	0	140	92	380	130	940	7.6	7.6	---
STREAMS TRIBUTARY TO LAKE ST. CLAIR															
04160800	Sagshaw Creek near Drayton Plains	Apr. 16, 1967	21	1120	38.9	187	0	48	13	205	52	385	8.2	8.2	9.5
04160900	Clinton River near Drayton Plains	Aug. 16 1830	79.5	1150	2.96	196	5	42	18	220	54	420	8.6	8.6	22.0
04161000	Clinton River near Auburn Heights	Apr. 11 1835	123	1150	116	212	3	39	25	227	51	465	8.4	8.4	7.0
04161100	Galloway Creek near Auburn Heights	Apr. 16 1745	17.8	0900	30.6	220	0	33	40	232	42	485	7.8	7.8	20.0
04161500	Paint Creek near Paint Creek near Rochester	Apr. 31 1635	38.9	1130	98.1	168	2	93	114	282	142	880	8.3	8.3	26.0
04161540	Paint Creek near Rochester	Apr. 11 1950	71.3	0920	69.5	334	0	135	64	370	158	865	8.3	8.3	---
04161580	Stony Creek near Romeo near Lakeville	Apr. 11 1950	25.6	1605	22.1	213	4	62	18	246	68	480	8.5	8.5	9.0
04161600	Stony Creek near Washington	Apr. 11 1835	36.5	1600	48	470	0	58	18	240	60	470	8.0	8.0	---
04161800	Stony Creek near Red Run near Royal	Apr. 11 1955	68	1640	137	200	2	40	14	215	49	400	8.3	8.3	---
04162000	Warren Creek near Big Beaver Creek near Plum Brook at Utica	Apr. 13 1555	23.5	1420	12.7	204	5	94	112	308	136	900	8.4	8.4	---
04164000	Clinton River near Fraser	Apr. 24 1555	16.1	1150	81.27	192	2	94	120	307	147	1220	8.4	20.5	---
04164010	North Branch Clinton River at Almont	Apr. 28 1150	445	0750	1058	215	0	67	64	294	68	1090	7.8	19.5	---
04164050	North Branch Clinton River at Almont	Apr. 10 1058	9.56	0750	16.5	231	3	64	16	267	75	530	8.3	8.5	---
04164100	East Pond Creek at Romeo	Apr. 21 1410	49.7	1410	1.70	220	0	48	18	214	34	620	8.0	8.0	---
04164200	Coon Creek near Tugnot Brook at Bay Point	Apr. 21 1225	21.8	1150	9.45	247	3	92	26	317	112	640	8.3	10.5	---
04164250	East Branch Coon Creek at Almont	Apr. 21 1150	21.8	1150	7.8	204	4	42	22	216	47	430	8.3	10.5	---
04164300	Highbank Creek near North Branch Clinton River near Mount Clemens	Apr. 8 1450	10.0	1105	5.46	295	4	23	32	250	4	540	8.3	8.3	---
04164350	Middle Branch Clinton River near Mount Clemens	Apr. 12 1105	10.0	1105	7.40	186	2	86	28	270	115	610	8.3	8.3	---
04164500	Middle Branch Clinton River near Mount Clemens	Apr. 30 1625	8.62	0930	10.01	310	0	84	26	332	78	640	8.0	8.0	---
04164600	Middle Branch Clinton River at Macomb	Apr. 32 ---	734	1240	11.05	1151	0	115	284	518	0	2400	7.1	7.1	---
04164900	Clinton River at Mount Clemens at Mount Clemens at	Apr. 21 0950	13.0	0850	10.3	251	0	120	33	358	152	670	8.2	10.0	---
04164900	Clinton River at Mount Clemens at	Apr. 8 1623	14.9	0950	3.36	354	0	113	34	384	94	755	8.1	8.1	---
04165000	Clinton River at Mount Clemens at	Apr. 12 0950	199	1240	4.36	193	0	93	66	288	130	680	8.2	8.2	---
04165000	Clinton River at Mount Clemens at	Aug. 12 1625	734	1240	180.37	184	0	148	52	382	172	570	8.2	27.0	---
04165000	Clinton River at Mount Clemens at	Aug. 29 1110	22.2	0920	26.2	261	0	76	48	284	70	620	7.6	7.6	---
04165000	Clinton River at Mount Clemens at	Apr. 20 0920	22.2	0920	26.2	261	0	66	44	274	99	640	8.2	8.2	6.5
04165000	Clinton River at Mount Clemens at	Aug. 15 1500	41.0	1500	26.9	195	2	90	46	258	120	700	8.3	8.3	---
04165000	Clinton River at Mount Clemens at	Aug. 30 1345	734	1345	13.7	217	0	85	42	248	70	560	7.8	7.8	---
04165000	Clinton River at Mount Clemens at	Aug. 29 1240	734	1240	309	246	0	57	58	248	46	645	7.6	7.6	---
STREAMS TRIBUTARY TO DETROIT RIVER															
04166000	River Rouge at Birmingham	Apr. 10 1385	36.9	1385	28.7	249	0	146	140	395	161	995	8.2	10.5	---
04166100	Southfield	Aug. 24 1500	87.9	1500	5.0	268	4	115	107	316	124	846	7.9	20.5	---
04166200	Southfield	Apr. 24 1240	9.48	1240	6.68	249	0	168	87	284	80	800	8.2	10.5	---
04166300	Upper River Rouge at Farmington	Apr. 19 1510	17.5	1510	4.12	295	0	122	151	440	186	1100	8.3	8.3	---
04166300	Upper River Rouge at Farmington	Aug. 15 1525	17.5	1525	11.5	288	0	96	126	408	164	1020	7.9	7.9	---
04166300	Upper River Rouge at Farmington	Aug. 15 1245	17.5	1245	11.5	288	0	77	77	352	99	630	8.0	8.0	22.0
04166300	Upper River Rouge at Farmington	Aug. 15 1240	17.5	1240	11.5	288	0	77	77	352	99	630	8.0	8.0	22.0

A Laboratory Analysis of Molybdenum Drive

EXTREME-FLOW INVESTIGATIONS OF STREAMS IN MICHIGAN
Chemical analyses in milligrams per liter, March to September 1967--Continued

Station number	Station name	Location	Drainage area (sq mi)	Date sampled	Time	Discharge (cfs)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃ Ca, Mg, etc	Specific conductance (micro-mhos at 25°C)	pH	Water temperature (°C)
STREAMS TRIBUTARY TO DETROIT RIVER --Continued														
04166500	River Rouge at Detroit	SW $\frac{1}{4}$ sec. 27, T. 1 S., R. 10 E.	187	Apr. 2, 1967	1600	1210	178	0	64	67	233	600	8.2	13.0
04167000	Middle River Rouge near Garden City	NW $\frac{1}{4}$ sec. 6, T. 2 S., R. 10 E.	99.8	Aug. 15, 1967	1400	10.2	264	3	77	126	326	106	950	8.3
04168000	Little River Rouge at Ingham	SE $\frac{1}{4}$ sec. 19, T. 2 S., R. 10 E.	83.2	Apr. 3, 1967	1715	13.4	195	0	72	130	276	116	855	8.0
				Aug. 23, 1967	1315	646	132	0	62	81	206	92	526	7.6
				Aug. 13, 1967	1443	1.55	239	0	64	88	202	6	500	8.0
STREAMS TRIBUTARY TO LAKE ERIE														
04169500	Huron River at Commerce	SE $\frac{1}{4}$ sec. 10, T. 2 N., R. 8 E.	49.6	Apr. 6, 1967	1515	86.3	216	3	24	17	207	27	410	8.4
04170000	Huron River at Milford	SE $\frac{1}{4}$ sec. 9, T. 2 N., R. 7 E.	125	Aug. 16, 1967	0850	13.7	225	3	29	25	224	36	560	8.3
04170500	Huron River near New Hudson	NE $\frac{1}{4}$ sec. 1, T. 1 N., R. 6 E.	143	Apr. 7, 1967	1240	159.4	239	3	38	26	232	11	470	8.3
04171500	Org Creek near Huron River at Ramburg	NW $\frac{1}{4}$ sec. 12, T. 1 N., R. 5 E.	31	Mar. 31, 1967	1445	40.3	198	0	33	26	222	36	485	8.2
04172000	Portage River near Pincenoy	SW $\frac{1}{4}$ sec. 34, T. 1 N., R. 4 E.	79	Aug. 17, 1967	1500	34.7	218	3	28	15	220	29	400	8.4
04173000	Mill Creek near Dexter	SE $\frac{1}{4}$ sec. 13, T. 1 S., R. 4 E.	506	Mar. 31, 1967	1305	81.8	312	0	42	24	242	76	488	8.2
04173500	Dexter River near Ann Arbor	SW $\frac{1}{4}$ sec. 18, T. 2 S., R. 5 E.	134	Apr. 28, 1967	1000	110.8	307	0	111	27	384	132	755	8.2
04174500	River Raisin near Tecumseh	NW $\frac{1}{4}$ sec. 28, T. 2 S., R. 6 E.	711	Apr. 21, 1967	0925	668	230	3	66	34	276	65	700	8.5
04175700	River Raisin near Adrian	NE $\frac{1}{4}$ sec. 21, T. 6 S., R. 4 E.	266	Aug. 27, 1967	1150	40.1	220	0	61	25	236	56	520	8.2
04176000	River Raisin near Monroe, on Ida Maybee Road	NW $\frac{1}{4}$ sec. 5, T. 7 S., R. 4 E.	485	Aug. 14, 1967	1210	14.2	212	0	52	17	234	56	545	8.2
04176500	River Raisin near Monroe, on Ida Maybee Road	NW $\frac{1}{4}$ sec. 5, T. 7 S., R. 4 E.	1034	Apr. 14, 1967	1200	47.9	273	0	73	28	302	78	640	8.0
				Apr. 15, 1967	0905	36.9	178	4	86	38	280	127	561	8.4
				Aug. 15, 1967	0950	60.9	198	0	130	38	268	130	690	7.6

A Laboratory analysis.

STREAMS TRIBUTARY TO LAKE ERIE

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, AUGUST TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	BICAR- BONATE (MCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	TEMP- ERATURE (DEG C)
04199500 - VERMILION RIVER, NR. VERMILION, OHIO (LAT 41 22 55 LONG 082 19 00)												
AUG.. 1968 27...	1430	3.9	176	0	95	28	336	224	80	537	8.1	21
04201500 - ROCKY RIVER NR. BEREA, OHIO (LAT 41 24 22 LONG 081 53 13)												
AUG.. 1968 28...	1000	10	150	0	144	86	480	260	137	840	7.2	17
04202000 - CUYAHOGA RIVER AT HIRAM RAPIDS OHIO (LAT 41 20 27 LONG 081 10 01)												
SFP.. 1968 24...	1055	49	118	0	30	16	186	129	32	294	7.4	17
04204000 - LITTLE CUYAHOGA RIVER AT MOGADDRE OHIO (LAT 41 03 45 LONG 081 23 40)												
SEP.. 1968 16...	--	3.0	120	0	39	26	200	141	42	361	7.6	21
04204500 - LITTLE CUYAHOGA RIVER AT MASSILLON RD AKRON OHIO (LAT 41 03 35 LONG 081 27 45)												
SFP.. 1968 16...	1315	9.5	102	0	68	20	242	152	68	386	7.5	19
04205000 - SPRINGFIELD LAKE OUTLET AT AKRON, OHIO (LAT 41 03 20 LONG 081 27 50)												
SEP.. 1968 30...	1045	3.5	124	0	51	52	262	162	60	473	8.1	14
04207200 - TINKERS CREEK AT BEDFORD OHIO (LAT 41 23 05 LONG 081 31 40)												
AUG.. 1968 30...	0930	12	178	6	88	178	655	382	226	1040	8.4	17
04207500 - OHIO CANAL AT INDEPENDENCE, OHIO (LAT 41 23 25 LONG 081 37 35)												
SEP.. 1968 16...	1325	78	170	0	150	300	964	300	160	1600	6.9	24
04209000 - CHAGRIN RIVER AT WILLOUGHBY, OHIO (LAT 41 37 51 LONG 081 24 13)												
AUG.. 1968 30...	1015	35	174	0	56	32	290	190	48	486	7.8	17
04211500 - MILL CREEK NEAR JEFFERSON, OHIO (LAT 41 45 10 LONG 080 48 00)												
AUG.. 1968 30...	1130	.40	64	0	37	22	168	93	40	262	7.1	20
04212000 - GRANO RIVER NEAR MADISON OHIO (LAT 41 44 26 LONG 081 02 48)												
AUG.. 1968 30...	1045	31	80	0	38	14	166	102	36	258	7.7	18
04212500 - ASHTABULA RIVER NR. ASHTABULA, OHIO (LAT 41 51 19 LONG 080 45 43)												
AUG.. 1968 30...	1200	.97	66	0	61	28	220	119	65	337	7.6	18
04213000 - CONNEAUT CREEK AT CONNEAUT, OHIO (LAT 41 55 34 LONG 080 36 18)												
AUG.. 1968 30...	1230	9.9	118	0	58	44	270	162	66	452	7.7	21

PESTICIDE ANALYSES OF STREAMS IN THE ST. LAWRENCE RIVER BASIN IN OHIO

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PESTICIDE ANALYSES, IN MICROGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	HEPTA- CHLOR EPOXIDE	METH- OXY- CHLOR	LINDANE	CHLOR- DANE	MALA- THION	METHYL PARA- THION	PARA- THION
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STREAMS TRIBUTARY TO LAKE ERIE

04193490 MAUMEE RIVER NEAR WATERVILLE, AT RAW WATER INTAKE TO BOWLING GREEN WATER TREATMENT PLANT (LAT 41°28'34", LONG 83°44'20")

OCT.							
27-31	.00	.00	.00	.00	.00	.00	.00
NOV.							
03-07	.00	.00	.00	.00	.00	.00	.00
APR.							
25-29	.00	.00	.00	.00	.00	.00	.00
MAY							
16-20	.00	.00	.00	.00	.00	.00	.11
JUNE							
25-29	.00	.00	.00	.00	.00	.00	.00
JULY							
22-26	.00	.00	.00	.00	.00	.00	.00
AUG.							
16-20	.00	.00	.00	.00	.00	.00	.00
SEPT.							
02-06	.00	.00	.00	.00	.00	.00	.00

04198002 SANDUSKY RIVER AT FREMONT, AT RAW WATER INTAKE TO FREMONT WATER TREATMENT PLANT (LAT 41°20'00", LONG 83°07'13")

OCT.							
17-21	.00	.00	.00	.00	.00	.00	.00
NOV.							
03-07	.00	.00	.00	.00	.00	.00	.00
APR.							
24-28	.00	.00	.00	.00	.00	.00	.00
MAY							
26-30	.00	.00	.00	.00	.00	.00	.00
JUNE							
24-28	.00	.00	.00	.00	.00	.00	.00
JULY							
09-13	.00	.00	.00	.00	.00	.00	.00
AUG.							
16-20	.00	.00	.00	.00	.00	.00	.00
SEPT.							
22-26	.00	.00	.00	.00	.00	.00	.00

04202402 CUYAHOGA RIVER NEAR KENT, AT RAW WATER INTAKE TO AKRON WATER TREATMENT PLANT AT LAKE ROCKWELL (LAT 41°10'55", LONG 81°20'26")

OCT.							
22-26	.00	.00	.00	.00	.00	.00	.00
NOV.							
03-07	.00	.00	.00	.00	.00	.00	.00
APR.							
24-28	.00	.00	.00	.00	.00	.00	.00
MAY							
04-08	.00	.00	.00	.00	.00	.00	.00
JUNE							
24-28	.00	.00	.00	.00	.00	.00	.00
JULY							
01-05	.00	.00	.00	.00	.00	.00	.00
AUG.							
14-18	.00	.00	.00	.00	.00	.00	.00
SEPT.							
23-27	.00	.00	.00	.00	.00	.00	.00

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2)	TOTAL IRON (FE)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	ALKA-LINITY AS CaCO3	SULFATE (SO4)
STREAMS TRIBUTARY TO LAKE SUPERIOR												
04010500 - PIGEON R AT MIDDLE FALLS, NR GRAND PORTAGE, MINN (LAT 48 00 44 LONG 089 36 58)												
APR.. 1968												
C3...	518	1	5.3	.30	7.2	2.5	1.2	2.4	28	0	23	8.2
25...	1860	1	5.7	.29	7.2	2.3	1.2	1.2	23	0	19	8.5
MAY												
C8...	994	10	4.4	.18	7.8	2.4	1.4	.6	29	0	24	6.5
JUNF												
C6...	2400	15	6.1	.31	9.0	3.1	1.4	1.4	33	0	27	8.5
JULY												
10...	648	17	5.0	.16	9.3	2.6	1.6	.3	35	0	29	7.0
AUG.												
13...	397	15	8.4	.27	12	3.6	3.0	1.0	48	0	39	7.7
04014500 - BAPTISM R NEAR BEAVER BAY, MINN (LAT 47 20 15 LONG 091 12 00)												
APR.. 1968												
C3...	192	1	7.4	.20	6.2	1.9	1.7	1.2	21	0	17	8.0
24...	998	1	7.0	.23	5.8	1.8	1.3	.7	13	0	11	11
MAY												
C7...	295	8	6.1	.22	6.5	2.0	1.7	.4	20	0	16	9.0
JUNE												
C5...	307	17	6.5	.21	7.0	2.2	1.7	.4	22	0	18	10
JULY												
11...	51	20	6.7	.28	11	3.4	2.2	.3	41	0	34	9.2
AUG.												
13...	15	15	6.4	.22	15	4.3	2.8	1.0	64	0	52	6.7
04015000 - BEAVER RIVER AT BEAVER BAY, MINN. (LAT 47 15 37 LONG 091 17 45)												
APR.. 1968												
1C...	493	4	6.8	.19	6.9	2.1	1.4	1.2	23	0	19	9.2
25...	825	2	6.6	.22	7.0	2.0	1.2	1.1	20	0	16	9.8
MAY												
C8...	252	10	5.2	.22	7.9	2.4	1.7	.4	25	0	21	9.8
JUNE												
C5...	327	15	5.3	.41	8.5	2.4	1.6	.5	28	0	23	8.8
JLLY												
18...	221	20	8.5	.45	10	7.8	1.6	.3	35	0	29	7.5
AUG.												
14...	7.2	15	8.2	.16	11	3.6	3.9	1.2	49	0	40	7.2
04010500 - PIGEON R AT MIDDLE FALLS, NR GRAND PORTAGE, MINN (LAT 48 00 44 LONG 089 36 58)												
APR.. 1968												
C3...	1.1	.1	1.1	.35	--	.6	.03	--	44	.07	76.9	
25...	.6	.2	1.0	.05	--	.9	.13	--	41	.09	326	
MAY												
C8...	.6	.1	.5	.02	--	.8	.04	--	40	.07	137	
JUNE												
C6...	.5	.1	1.1	.06	--	1.0	.05	--	49	.10	492	
JULY												
10...	1.6	.1	.4	.04	--	3.3	.00	--	49	.08	98.0	
AUG.												
13...	1.8	.5	.5	.04	--	.9	.03	--	63	.11	83.6	
04014500 - BAPTISM R NEAR BEAVER BAY, MINN (LAT 47 20 15 LONG 091 12 00)												
APR.. 1968												
C3...	1.7	.2	1.3	.25	--	.5	.02	--	41	.09	34.2	
24...	1.3	.3	1.8	.11	--	.0	.02	--	37	.08	162	
MAY												
C7...	.7	.2	1.0	.00	--	.8	.03	--	39	.08	45.4	
JUNE												
C5...	.5	.2	1.1	.10	--	.0	.03	--	41	.09	53.9	
JULY												
11...	1.4	.4	1.0	.02	--	.8	.07	--	56	.10	10.7	
AUG.												
13...	1.7	.2	.4	.03	--	1.2	.04	--	72	.12	3.74	
04015000 - BEAVER RIVER AT BEAVER BAY, MINN. (LAT 47 15 37 LONG 091 17 45)												
APR.. 1968												
10...	1.1	.2	1.1	.14	--	.7	.01	--	42	.10	93.2	
25...	.7	.2	1.1	.06	--	.9	.04	--	41	.09	154	
MAY												
C8...	1.0	.2	1.0	.00	--	1.0	.03	--	43	.08	42.2	
JUNE												
C5...	.5	.2	1.3	.24	--	1.0	.06	--	45	.10	64.5	
JULY												
18...	.8	.4	1.5	.03	--	1.1	.04	--	53	.12	51.3	
AUG.												
14...	2.4	.3	.6	.02	--	.9	.05	--	64	.11	1.56	

DATE CHLORIDE (CL) FLUORIDE (F) NITRATE (NO3) ORTHO PHOSPHATE (PO4) PHOSPHATE (PO4) TOTAL ALUMINUM (AL) BORON (B) DISSOLVED OXYGEN (SUM OF CONSTITUENTS) DIS-SOLVED SOLIDS (TONS PER AC-FT) DIS-SOLVED SOLIDS (TONS PER DAY)

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	HARD-NESS (CA, MG)	HARD-NESS	NON-CARBONATE	SODIUM AD-SORPTION RATIO	PERCENT SODIUM	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
STREAMS TRIBUTARY TO LAKE SUPERIOR								
04010500 - PIGEON R AT MIDDLE FALLS, NR GRAND PORTAGE, MINN (LAT 48 00 44 LONG 089 36 58)								
APR., 1968								
03...	28	5	.1	8	66	7.0	52	
25...	27	8	.1	8	58	6.5	55	
MAY								
08...	29	5	.1	9	66	6.7	40	
JUNE								
06...	35	8	.1	8	70	6.7	100	
JULY								
10...	34	5	.1	9	73	7.0	25	
AUG.								
13...	44	5	.2	12	97	7.2	50	

04014500 - BAPTISH R NEAR BEAVER BAY, MINN (LAT 47 20 15 LONG 091 12 00)								
APR., 1968								
03...	23	6	.2	13	57	6.9	62	
24...	22	11	.1	11	53	6.4	60	
MAY								
07...	24	8	.1	13	56	7.0	75	
JUNE								
05...	27	9	.1	12	57	6.6	60	
JULY								
11...	40	7	.2	10	85	7.1	70	
AUG.								
13...	56	3	.2	10	114	7.2	40	

04015000 - BEAVER RIVER AT BEAVER BAY, MINN. (LAT 47 15 37 LONG 091 17 45)								
APR., 1968								
10...	26	7	.1	10	59	7.0	58	
25...	26	10	.1	9	56	6.5	100	
MAY								
08...	30	9	.1	11	66	7.1	75	
JUNE								
05...	31	8	.1	10	62	6.7	100	
JULY								
18...	37	8	.1	9	68	7.5	100	
AUG.								
14...	43	3	.3	16	97	7.1	40	

DATE	DISCHARGE (CFS)	TEMPERATURE (DEG C)	SILICA (STO2)	TOTAL IRON (PFE)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	PO-TASSIUM (K)	BICARBONATE (HCO3)	CARBONATE (CO3)	ALKALINITY AS CaCO3	SULFATE (SO4)
04024000 - ST. LOUIS RIVER AT SCANLON, MINN. (LAT 46 42 12 LONG 092 25 07)												
DEC., 1967												
07...	972	1	6.7	.31	23	7.4	8.5	1.8	81	0	66	20
APR., 1968												
01...	--	2	6.9	.30	18	6.2	6.3	4.7	67	0	55	21
MAY												
09...	4603	10	5.4	.38	15	5.3	4.7	1.2	44	0	36	18
09...	4580	--	--	--	--	--	--	--	--	--	--	--
JUNE												
04...	3830	15	5.0	.47	16	5.4	5.1	1.2	51	0	42	16
JULY												
06...	2220	22	6.6	.64	18	3.6	10	1.1	70	0	57	18
AUG.												
14...	1240	16	7.7	.97	20	6.2	6.7	1.6	62	0	51	16
SEP.												
16...	1560	18	6.9	.67	17	5.9	5.9	1.4	57	0	47	19

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	ORTHO PHOSPHATE (PO4)	PHOSPHATE (PO4)	TOTAL ALUMINIUM (AL)	BORON (B)	DISSOLVED OXYGEN	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	DIS-SOLVED SOLIDS (TONS PFR AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)
DEC., 1967											
07...	15	.3	1.0	.23	--	.6	.04	--	125	.25	480
APR., 1968											
01...	9.0	.2	1.4	.06	--	.7	.08	--	108	.21	--
MAY											
09...	7.0	.2	1.2	.09	--	1.1	.07	--	81	.16	1440
09...	--	--	--	--	--	--	--	--	--	--	--
JUNE											
04...	4.9	.2	1.8	.08	--	1.2	.10	--	83	.17	1300
JULY											
08...	8.6	.3	1.7	.27	--	1.4	.03	--	105	.20	887
AUG.											
14...	14	.3	1.5	.16	--	1.1	.05	--	107	.22	546
SEP.											
16...	9.5	.2	1.1	.19	.52	.9	.07	--	96	.20	632

DATE	HARD-NESS (CA, MG)	HARD-NESS	NON-CARBONATE	SODIUM AD-SORPTION RATIO	PERCENT SODIUM	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
04024000 - ST. LOUIS RIVER AT SCANLON, MINN. (LAT 46 42 12 LONG 092 25 07)								
DEC., 1967								
07...	88	22	.4	17	230	7.5	84	
APR., 1968								
01...	71	16	.3	15	181	7.1	90	
MAY								
09...	58	22	.3	14	140	6.7	75	
JUNE								
05...	--	--	--	--	--	--	--	
04...	61	19	.3	15	135	6.6	175	
JULY								
08...	59	1	.6	26	170	6.9	100	
AUG.								
14...	75	25	.3	16	178	6.7	80	
SEP.								
16...	66	19	.3	16	161	7.4	120	

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

STREAMS TRIBUTARY TO LAKE SUPERIOR

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)	Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)
04014500 BAPTISM RIVER NEAR BEAVER BAY, MINN.							
Dec. 6, 1967	28	2	.15	June 5, 1968	312	2	1.7
Jan. 9, 1968	10	3	.08	June 6	630	7	12
Feb. 6	13	2	.07	June 7	658	7	12
Mar. 5	7.4	3	.06	June 14	582	3	4.7
Mar. 30	554	18	27	June 15	516	3	4.2
Mar. 31	475	10	13	June 16	430	4	4.6
Apr. 1	326	6	5.3	June 17	367	4	4.0
Apr. 2	270	5	3.6	June 18	305	3	2.5
Apr. 3	192	3	1.6	June 19	265	2	1.4
Apr. 4	158	4	1.7	June 20	212	1	.57
Apr. 5	195	13	5.4	June 21	221	3	1.8
Apr. 6	161	24	10	June 22	248	4	2.7
Apr. 7	188	18	9.1	June 23	421	5	5.7
Apr. 8	412	36	44	June 24	376	4	4.1
Apr. 9	440	49	58	June 25	284	3	2.3
Apr. 10	412	46	51	June 26	216	3	1.7
Apr. 11	412	42	47	June 27	180	2	.97
Apr. 12	487	40	53	June 28	161	2	.87
Apr. 13	478	38	49	June 29	152	2	.82
Apr. 14	554	34	51	June 30	144	2	.78
Apr. 15	421	18	23	July 1	155	2	.84
Apr. 16	449	10	12	July 2	164	2	.89
Apr. 22	896	20	48	July 3	146	2	.79
Apr. 24	1060	14	40	July 4	167	2	.90
Apr. 25	738	8	15	July 11	67	5	.90
Apr. 26	610	3	4.9	July 15	421	10	11
Apr. 27	630	1	1.7	July 16	312	5	4.2
Apr. 28	610	1	1.6	July 17	277	4	3.0
Apr. 29	620	1	1.7	July 18	221	4	2.4
Apr. 30	601	1	1.6	July 19	208	7	3.9
May 1	525	3	4.2	Aug. 13	14	6	.23
May 2	458	3	3.7	Aug. 22	2480	59	416
May 3	385	2	2.1	Aug. 23	2380	39	251
May 4	421	2	2.3	Aug. 24	2100	13	74
May 5	358	4	3.9	Aug. 25	1370	7	26
May 6	305	3	2.5	Aug. 26	924	6	15
May 7	291	2	1.6	Aug. 27	620	6	10
May 8	305	2	1.6	Aug. 28	458	4	4.9
May 9	319	2	1.7	Aug. 29	319	3	2.6
May 10	284	1	.77	Aug. 30	232	2	1.3
May 11	243	1	.66	Aug. 31	192	2	1.0
May 12	227	1	.61	Sept. 1	200	4	2.2
May 13	212	2	1.1	Sept. 2	176	4	1.9
May 14	216	3	1.7	Sept. 3	149	2	.80
May 15	265	2	1.4	Sept. 4	505	12	18
May 16	630	10	17	Sept. 5	600	12	19
May 17	706	4	7.6	Sept. 6	690	11	20
May 18	610	2	3.3	Sept. 7	750	6	12
May 19	468	3	3.8	Sept. 8	730	5	9.8
May 20	385	3	3.1	Sept. 9	580	5	7.8
May 21	312	3	2.5	Sept. 10	370	6	6.0
May 22	259	2	1.4	Sept. 11	230	8	5.0
May 23	265	2	1.4	Sept. 12	140	5	1.9
May 24	277	4	3.0	Sept. 13	105	2	.57
May 25	238	3	1.9	Sept. 17	170	9	4.1
May 26	255	4.8	3.3	Sept. 18	770	18	37
May 27	1030	44	122	Sept. 19	660	8	14
May 28	1060	13	37	Sept. 20	500	4	5.4
May 29	896	5	12	Sept. 21	310	4	3.3
May 30	668	6	11	Sept. 22	230	4	2.5
May 31	534	7	10	Sept. 23	210	3	1.7
June 1	582	9	14	Sept. 24	175	4	1.9
June 2	534	5	7.2	Sept. 25	140	4	1.5
June 3	430	3	3.5	Sept. 26	120	3	.97
June 4	367	2	2.0	Sept. 27	105	3	.85
				Sept. 28	95	4	1.0
				Sept. 29	90	5	1.2
				Sept. 30	85	5	1.1

STREAMS TRIBUTARY TO LAKE SUPERIOR

PERIODIC DETERMINATIONS OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)	Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)
04018750 ST. LOUIS RIVER AT FORBES, MINN.							
Jan. 9, 1968	44	4	0.47	June 14, 1968	2480	47	315
Jan. 31	38	4	.41	June 15	2630	61	433
Feb. 29	37	2	.20	June 16	2700	72	525
Apr. 3	430	18	21	June 17	2710	57	417
Apr. 4	400	8	8.6	June 18	2650	41	293
Apr. 5	390	12	13	June 19	2470	41	273
Apr. 6	360	11	11	June 20	2240	52	314
Apr. 7	350	9	8.5	June 21	2000	43	232
Apr. 8	385	11	11	June 22	1820	25	123
Apr. 9	460	10	12	June 23	1770	28	134
Apr. 10	515	10	14	June 24	1750	35	165
Apr. 11	550	15	22	June 25	1680	32	145
Apr. 12	543	16	23	June 26	1580	26	111
Apr. 13	515	8	11	June 27	1490	22	88
Apr. 14	504	8	11	June 28	1340	20	72
Apr. 15	498	11	15	June 29	1260	36	122
Apr. 16	592	9	14	June 30	1200	72	233
Apr. 17	750	13	26	July 1	1200	22	71
Apr. 18	794	32	69	July 2	1130	23	70
Apr. 19	776	21	44	July 3	1060	23	66
Apr. 20	765	15	31	July 4	1010	11	30
Apr. 21	816	14	31	July 5	957	8	21
Apr. 22	888	20	48	July 6	881	9	21
Apr. 23	1120	32	97	July 7	809	13	28
Apr. 24	1360	40	147	July 8	614	11	18
Apr. 25	1440	39	152	July 9	702	5	9.5
Apr. 26	1570	40	170	July 10	636	6	10
Apr. 30	2140	50	288	July 11	585	5	7.9
May 1	2220	85	509	July 12	512	5	6.9
May 2	2310	72	449	July 13	540	8	8.7
May 3	2340	82	518	July 14	529	5	7.1
May 4	2340	55	347	July 15	508	11	15
May 5	2290	45	278	July 16	508	6	8.2
May 6	2170	39	228	July 17	501	6	8.1
May 7	2030	31	170	Aug. 22	384	11	11
May 8	1920	24	124	Aug. 23	709	38	73
May 9	1820	22	108	Aug. 24	1350	61	222
May 10	1700	70	321	Aug. 25	1650	69	307
May 11	1560	68	286	Aug. 26	1720	35	162
May 12	1450	20	78	Aug. 27	1800	50	243
May 13	1280	13	45	Aug. 28	1820	49	241
May 14	1240	14	47	Aug. 29	1750	44	208
May 15	1070	8	23	Aug. 30	1580	37	158
May 16	1030	9	25	Aug. 31	1360	31	114
May 17	1010	12	33	Sept. 1	1220	44	145
May 18	976	12	32	Sept. 2	1090	18	53
May 19	953	8	21	Sept. 3	968	14	37
May 20	907	14	34	Sept. 4	888	13	31
May 21	794	8	17	Sept. 7	813	12	26
May 22	854	13	30	Sept. 8	820	11	24
May 23	813	14	31	Sept. 9	816	9	20
May 24	783	6	13	Sept. 10	791	10	21
May 25	742	6	12	Sept. 11	754	9	18
May 26	706	7	13	Sept. 12	713	7	13
May 27	761	7	14	Sept. 13	568	6	9.2
May 28	846	23	52	Sept. 14	605	6	9.8
May 29	892	16	38	Sept. 15	573	9	14
June 4	1040	11	31	Sept. 16	530	15	21
June 5	934	9	23	Sept. 17	513	12	17
June 6	1020	9	25	Sept. 18	581	8	13
June 7	1060	10	29	Sept. 19	672	7	13
June 8	1200	22	71	Sept. 20	658	7	12
June 9	1470	22	87	Sept. 21	634	6	10
June 10	1620	28	122	Sept. 24	573	5	7.8
June 11	1900	71	364	Sept. 27	458	4	4.9
June 12	2070	39	218	Sept. 28	519	4	5.6
June 13	2180	35	206	Sept. 29	606	5	8.2

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MICHIGAN
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	DIS-SOLVED IRON (FE)	BICARBONATE (HCO ₃)	CARBONATE (CO ₃)	SULFATE (SO ₄)	CHLORIDE (CL)	NITRATE (NO ₃)	DIS-SOLVED SOLIDS (RESIDUE AT 180°C)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	TEMPERATURE (DEG C)	COLOR	TURBIDITY
STREAMS TRIBUTARY TO LAKE SUPERIOR															
04044563 BIG CREEK NEAR HARVEY (LAT 46 26 04 LONG 087 19 04)															
AUG 08	29	--	98	0	6.8	1.0	1.6	116	88	8	168	7.7	11	--	--
04044574 CEDAR CREEK NEAR HARVEY (LAT 46 27 24 LONG 087 21 23)															
AUG 08	--	--	82	0	6.0	1.0	.4	102	70	3	140	7.5	--	--	--
04044583 CHERRY CREEK NEAR HARVEY (LAT 46 28 07 LONG 087 21 53)															
Aug 08	19	--	106	0	7.6	2.5	.1	112	92	5	184	8.1	11	--	--
STREAMS TRIBUTARY TO LAKE MICHIGAN															
04058100 MIDDLE BRANCH ESCANABA RIVER NEAR PRINCETON (LAT 46 19 02 LONG 087 30 07)															
OCT 25	--	--	30	0	13	6.0	1.5	65	38	13	85	7.5	7	--	--
JAN 18	--	--	58	0	13	3.0	1.5	91	59	11	120	7.9	1	40	--
APR 24	--	--	16	0	12	2.0	1.1	48	24	11	52	6.9	8	50	2.3
04058500 EAST BRANCH ESCANABA RIVER AT GWINN (LAT 46 17 10 LONG 087 26 00)															
OCT 27	--	--	38	0	24	4.0	2.2	94	54	23	134	7.6	4	--	--
JAN 18	--	--	76	0	34	7.0	1.2	140	94	32	212	7.6	1	5	2.3
APR 24	--	--	34	0	29	6.0	1.3	103	58	30	136	7.0	7	100	2.0
04102192 SOUTH BRANCH PAW PAW RIVER NEAR PAW PAW (LAT 42 14 12 LONG 085 53 10)															
MAY 29	--	--	240	0	54	12	2.7	304	289	72	493	7.9	--	--	--
04104280 BATTLE CREEK RIVER NEAR CHARLOTTE (LAT 42 29 40 LONG 084 52 08)															
JUNE 28	--	.18	136	0	43	6.0	12	254	166	54	335	7.3	--	75	10
04104290 BIG CREEK NEAR OLIVET (LAT 42 28 10 LONG 084 53 25)															
JUNE 28	--	.13	198	0	109	4.0	20	412	294	132	548	7.3	--	100	10
04104450 BATTLE CREEK RIVER NEAR WACOSTA (LAT 42 26 44 LONG 084 58 53)															
JUNE 28	--	.14	156	0	62	8.0	21	284	212	84	423	7.3	--	125	6.0
04109700 ORCHARD CREEK NEAR FITCHBURG (LAT 42 26 50 LONG 084 14 30)															
JUNE 28	--	--	118	0	78	3.0	17	298	194	98	370	6.9	--	200	1.0
04110590 BATEESE CREEK NEAR WILLIAMSTON (LAT 42 26 47 LONG 084 19 46)															
JUNE 28	--	.30	130	0	43	1.0	4.9	246	160	54	297	7.6	--	180	.0
04110645 HUNTOON CREEK NEAR LESLIE (LAT 42 27 04 LONG 084 25 54)															
JUNE 28	--	--	260	0	152	26	38	574	420	207	794	7.2	--	25	--
04110890 SPRING BROOK NEAR CHARLESWORTH (LAT 42 27 03 LONG 084 39 33)															
JUNE 28	--	.18	166	0	26	2.0	1.6	196	164	28	317	7.3	--	115	1.0
04112800 KALAMINK CREEK NEAR MILLVILLE (LAT 42 32 27 LONG 084 10 39)															
JUNE 28	--	.18	216	0	83	6.0	30	428	290	113	523	7.7	--	150	.0
04111285 KALAMINK CREEK NEAR WEBBERVILLE (LAT 42 36 00 LONG 084 11 00)															
JUNE 28	--	.24	152	0	76	8.0	61	368	258	133	493	7.0	--	250	1.0
04111402 DOAN CREEK NEAR DANSVILLE (LAT 42 36 02 LONG 084 16 07)															
JUNE 28	--	.19	190	0	73	10	23	318	260	104	493	7.3	--	150	2.0
04111500 DEER CREEK NEAR DANSVILLE (LAT 42 36 30 LONG 084 19 15)															
JUNE 28	--	.13	194	0	46	8.0	12	312	200	41	424	7.3	--	100	.0
04111610 UNNAMED TRIBUTARY NEAR WILLIAMSTON (LAT 42 42 04 LONG 084 17 03)															
JUNE 28	--	.04	282	0	86	14	22	446	342	111	639	7.9	--	50	.0
04111630 COON CREEK NEAR WILLIAMSTON (LAT 42 42 55 LONG 084 18 02)															
JUNE 28	--	.04	286	0	37	6.0	2.8	306	280	45	509	7.6	--	70	.0
04112000 SLOAN CREEK NEAR WILLIAMSTON (LAT 42 40 30 LONG 084 21 50)															
JUNE 28	--	.06	162	0	34	11	--	194	182	49	368	7.3	--	75	9.0
04112500 RED CEDAR RIVER AT EAST LANSING (LAT 42 43 40 LONG 084 28 40)															
JUNE 28	--	.12	132	0	36	8.0	14	168	158	50	328	7.3	--	100	1.0
04113000 GRAND RIVER AT LANSING (LAT 42 45 05 LONG 084 33 20)															
JUNE 28	--	.10	158	0	40	10	4.2	188	172	42	364	7.4	--	75	8.0

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS- CHARGE (CFS)	DIS- SOLVED IRON (FE)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	NITRATE (NO3)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 °C)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECIFIC COND- UCTANCE (MICRO- MHOS)	PH	TEM- PERA- TURE (DEG C)	COL- OR	TUR- BID- ITY
04114495 UNNAMED TRIBUTARY TO LOOKINGGLASS RIVER NEAR OVID (LAT 42 48 51 LONG 084 44 58)															
JUNE 30	--	.06	216	0	52	14	20	344	256	78	491	8.1	18	60	20
04114500 LOOKINGGLASS RIVER NEAR EAGLE (LAT 42 49 45 LONG 089 46 40)															
JUNE 30	--	--	196	0	51	10	9.6	304	226	66	435	7.2	18	85	10
04114592 LITTLE MAPLE RIVER NEAR OVID (LAT 42 57 28 LONG 084 25 38)															
JUNE 30	--	.19	238	0	60	6.0	4.6	354	268	72	486	7.2	--	150	.0
04115000 MAPLE RIVER AT MAPLE RAPIDS (LAT 43 06 35 LONG 084 41 35)															
JUNE 30	--	--	290	0	51	18	4.9	372	300	62	582	7.5	--	25	1.0
04115020 SOUTH FORK HAYWORTH CREEK NEAR MAPLE RAPIDS (LAT 43 02 56 LONG 084 38 28)															
JUNE 30	--	.06	160	0	44	16	28	308	206	75	424	8.0	--	60	45
04115050 HAYWORTH CREEK NEAR MAPLE RAPIDS (LAT 43 04 09 LONG 084 42 00)															
JUNE 30	--	.12	174	0	56	18	29	330	236	94	481	7.4	--	60	130
04115095 COX DRAIN NEAR MAPLE RAPIDS (LAT 43 05 10 LONG 084 41 00)															
JUNE 30	--	--	216	10	60	13	37	382	294	100	546	8.5	--	22	10
04115695 SPALDING DRAIN NEAR ST. JOHN (LAT 42 57 57 LONG 084 34 55)															
JUNE 30	--	--	168	0	56	14	28	326	226	88	446	7.2	--	70	260
04115730 STONY CREEK NEAR FOWLER (LAT 42 57 26 LONG 084 39 39)															
JUNE 30	--	.13	166	0	59	10	21	314	222	86	431	7.3	--	90	220
04115785 FULLER CREEK NEAR WESTPHALIA (LAT 42 58 11 LONG 084 47 35)															
JUNE 30	--	.08	196	0	48	10	16	298	226	66	444	7.3	19	60	60

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN PENNSYLVANIA

STREAMS TRIBUTARY TO LAKE ERIE

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, APRIL TO SEPTEMBER 1968

DATE	DIS- CHARGE (CFS)	SILICA (SIO2)	DIS- SOLVED IRON (FE)	DIS- SOLVED MAN- GANESE (MN)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	SODIUM PLUS POTAS- SIUM (NA K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)
APR 29	35.0	--	--	--	28	6.4	--	--	11	90	0	31
SEPT 05	17.9	--	--	--	43	10	--	--	15	143	3	37
DATE	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	COLOR	TEMP- ERATURE (DEG C)	PHOS- PHATE (PO4)	NICKEL (NI)
APR 29	9.5	--	.8	--	97	23	239	7.3	3	15	--	--
SEPT 05	14	--	2.1	--	150	32	340	8.5	10	19	--	--

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN NEW YORK
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SILICA (SiO ₂)	DIS- SOLVED IRON (FE)	DIS- SOLVED MAN- GANESE (MN)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO ₃)	SULFATE (SO ₄)
STREAMS TRIBUTARY TO LAKE ONTARIO												
04242730 - FISH CREEK AT FISH CREEK LANDING, N.Y. (LAT 43 13 16 LONG 075 42 03)												
NOV., 1967 14...	1615	2490	3.3	--	--	6.7	1.8	.01	1.1	.2	22	7.5
04243822 - CANASERAGA CREEK AT LAKEPORT, N.Y. (LAT 43 08 43 LONG 075 51 52)												
OCT., 1967 10...	0950	--	5.6	--	--	220	30	5.0	27	3.6	277	444
NOV. 13...	1400	399	5.5	--	--	106	22	2.2	14	3.4	233	163
04244000 - CHITTENANGO CREEK NEAR CHITTENANGO, N.Y. (LAT 43 01 23 LONG 075 51 32)												
MAR., 1968 19...	1100	218	3.7	--	--	58	11	.46	4.8	1.3	176	45
04245000 - LIMESTONE CREEK AT FAYETTEVILLE, N.Y. (LAT 43 01 45 LONG 076 00 50)												
MAR., 1968 19...	1600	490	3.8	--	--	65	12	.66	5.2	1.3	191	50
04253000 - SUGAR RIVER AT TALCOTTVILLE, N. Y. (LAT 43 32 17 LONG 075 21 58)												
MAR., 1968 27...	1720	2300	2.9	--	--	14	1.2	--	1.2	.9	40	5.3
04256000 - INDEPENDENCE RIVER AT DONNATTSBURG, N. Y. (LAT 43 44 50 LONG 075 20 05)												
MAR., 1968 26...	--	590	--	--	--	--	--	--	--	--	--	--
04258700 - DEER RIVER AT DEER RIVER, N. Y. (LAT 43 55 49 LONG 075 35 31)												
MAR., 1968 27...	1510	2300	--	--	--	14	--	--	--	--	40	--
STREAMS TRIBUTARY TO ST. LAWRENCE RIVER												
04260910 - OSWEGATCHIE RIVER AT WANAKENA, N. Y. (LAT 44 07 56 LONG 074 55 29)												
AUG., 1968 14...	1450	--	8.1	.62	.09	3.4	.6	--	1.3	.4	8	5.9
04261900 - LITTLE RIVER AT OSWEGATCHIE, N. Y. (LAT 44 11 32 LONG 075 04 08)												
AUG., 1968 13...	1320	--	9.9	.48	.12	13	2.7	--	2.6	1.0	31	18
04262250 - WEST BRANCH OSWEGATCHIE R. NEAR HARRISVILLE N.Y. (LAT 44 05 10 LONG 075 20 59)												
AUG., 1968 14...	1850	--	4.4	.72	.30	3.7	.7	--	1.2	.5	10	6.1

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN NEW YORK

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CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR	TEMPERATURE (DEG C)
STREAMS TRIBUTARY TO LAKE ONTARIO												
04242730 - FISH CREEK AT FISH CREEK LANDING, N.Y. (LAT 43 13 16 LONG 075 42 03)												
NOV., 1967 14...	.5	.2	1.0	.01	--	33	24	6	59	7.4	--	4
04243822 - CAMASERAGA CREEK AT LAKEPORT, N.Y. (LAT 43 08 43 LONG 075 51 52)												
OCT., 1967 10...	45	.2	1.4	.70	--	920	673	446	1280	7.9	--	14
NOV., 13...	25	.2	6.1	.20	--	462	355	164	720	8.0	--	6
04244000 - CHITTENANGO CREEK NEAR CHITTENANGO, N.Y. (LAT 43 01 23 LONG 075 51 32)												
MAR., 1968 19...	10	.1	2.9	.10	--	223	190	46	383	7.8	--	3
04245000 - LIMESTONE CREEK AT FAYETTEVILLE, N.Y. (LAT 43 01 45 LONG 076 00 50)												
MAR., 1968 19...	12	.1	2.4	.14	--	267	212	55	419	8.1	--	6
04253000 - SUGAR RIVER AT TALCOTTVILLE, N. Y. (LAT 43 32 17 LONG 075 21 58)												
MAR., 1968 27...	2.0	.1	2.8	--	60	50	40	7	94	7.5	25	2
04256000 - INDEPENDENCE RIVER AT DONNATTSBURG, N. Y. (LAT 43 44 50 LONG 075 20 05)												
MAR., 1968 26...	--	--	--	--	--	--	--	--	--	--	--	3
04258700 - DEER RIVER AT DEER RIVER, N. Y. (LAT 43 55 49 LONG 075 35 31)												
MAR., 1968 27...	--	--	--	--	56	--	--	--	94	7.2	12	2
STREAMS TRIBUTARY TO ST. LAWRENCE RIVER												
04260910 - OSWEGATCHIE RIVER AT MANAKENA, N. Y. (LAT 44 07 56 LONG 074 55 29)												
AUG., 1968 14...	1.0	.1	.8	--	41	26	11	4	32	6.3	80	20
04261900 - LITTLE RIVER AT OSWEGATCHIE, N. Y. (LAT 44 11 32 LONG 075 04 08)												
AUG., 1968 13...	4.3	.2	.3	--	75	67	44	19	108	7.0	15	18
04262250 - WEST BRANCH OSWEGATCHIE R. NEAR HARRISVILLE N.Y. (LAT 44 05 10 LONG 075 20 59)												
AUG., 1968 14...	1.1	.2	.4	--	33	23	12	4	34	6.5	3	20

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN NEW YORK

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SILICA (SI02)	DIS- SOLVED IRON (FE)	DIS- SOLVED MAN- GANESE (MN)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO3)	SULFATE (SO4)
STREAMS TRIBUTARY TO ST. LAWRENCE RIVER--CONTINUED												
04262320 - MIDDLE BRANCH OSMEGATCHIE R. NR HARRISVILLE, NY (LAT 44 03 52 LONG 075 14 32)												
AUG., 1968 14...	1530	--	4.6	1.2	.12	2.0	.4	--	1.0	.5	2	6.1
04264365 - SDUTH BRANCH GRASS RIVER AT DEGRASSE, N. Y. (LAT 44 21 02 LDNG 075 04 29)												
AUG., 1968 12...	1620	--	8.5	.59	.14	5.3	1.3	--	1.7	.5	16	5.9
04264400 - MIDDLE BRANCH GRASS RIVER NEAR CLARE, N.Y. (LAT 44 22 34 LONG 075 03 42)												
AUG., 1968 12...	1730	--	8.1	.56	.12	6.1	1.5	--	1.4	.5	18	6.7
04265453 - SOUTH INLET NEAR RAQUETTE LAKE, N.Y. (LAT 43 46 12 LONG 074 38 12)												
SEP., 1968 10...	0945	13	7.5	--	--	3.3	.8	--	1.1	.7	8	8.8
04265465 - RAQUETTE RIVER NEAR DEERLAND, N.Y. (LAT 43 55 34 LONG 074 28 37)												
SEP., 1968 10...	1245	102	3.9	--	--	3.2	.7	--	1.0	.6	6	8.8
04266850 - RAQUETTE RIVER TRIBUTARY NEAR STARK, N.Y. (LAT 43 28 57 LONG 074 44 35)												
JULY, 1968 22...	1620	13	2.6	.79	.13	4.0	1.0	--	1.0	.3	6	7.2
04268400 - ST. REGIS RIVER NEAR PAUL SMITHS, N.Y. (LAT 44 25 49 LONG 074 20 00)												
JULY, 1968 16...	1200	12	6.5	--	--	5.4	1.4	--	1.8	.5	17	4.9
04268510 - ST. REGIS RIVER NEAR SANTA CLARA, N.Y. (LAT 44 31 22 LONG 074 29 33)												
JULY, 1968 19...	0950	136	6.1	.95	.13	5.6	1.6	--	1.2	.4	18	5.3
04268710 - LAKE OZONIA OUTLET NEAR ST. REGIS FALLS, N.Y. (LAT 44 40 29 LONG 074 36 11)												
JULY, 1968 22...	1110	25	6.2	.28	.10	6.2	1.6	--	1.0	.3	18	5.7
04269200 - DEER RIVER NEAR DICKINSON CENTER, N.Y. (LAT 44 43 52 LONG 074 30 36)												
JULY, 1968 15...	1130	34	4.9	--	--	6.1	1.8	--	1.5	.4	20	6.9
04270050 - SALMON RIVER NEAR FAY, N.Y. (LAT 44 53 55 LDNG 074 19 14)												
JULY, 1968 02...	1020	349	7.6	--	--	12	3.3	--	1.9	.6	44	--
04270700 - TROUT RIVER AT TROUT RIVER, N.Y. (LAT 44 59 23 LONG 074 17 56)												
JULY, 1968 11...	1450	93	6.0	--	--	14	3.5	--	1.7	.6	46	14
04276895 - WEST BROOK AT LAKE GEDRGE, N.Y. (LAT 43 25 02 LDNG 073 42 49)												
SEP., 1968 05...	--	--	11	.02	.03	30	5.9	--	7.3	.8	89	11
04277490 - SHELIVING ROCK BROOK AT SHELIVING ROCK, N.Y. (LAT 43 33 10 LONG 073 36 25)												
SEP., 1968 16...	1440	--	6.1	.09	.00	12	2.2	--	1.6	.3	41	10
04278300 - NORTHWEST BAY BROOK NEAR BOLTON LANDING, N.Y. (LAT 43 39 48 LONG 073 36 14)												
AUG., 1968 27...	1545	--	5.9	.01	.02	15	2.6	--	1.2	.3	48	12

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO ₃)	TOTAL PHOSPHORUS (PO ₄)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	DISSOLVED SOLIDS (SUM OF TUENTS)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	COLOR	TEMPERATURE (DEG C)
STREAMS TRIBUTARY TO ST. LAWRENCE RIVER--CONTINUED												
04262320 - MIDDLE BRANCH OSWEGATCHIE R. NR HARRISVILLE, NY (LAT 44 03 52 LONG 075 14 32)												
AUG., 1968 14...	1.4	.1	.7	--	38	18	6	5	25	5.5	70	22
04264365 - SOUTH BRANCH GRASS RIVER AT DEGRASSE, N. Y. (LAT 44 21 02 LONG 075 04 29)												
AUG., 1968 12...	1.6	.1	.6	--	45	33	18	6	47	6.7	50	19
04264400 - MIDDLE BRANCH GRASS RIVER NEAR CLARE, N.Y. (LAT 44 22 34 LONG 075 03 42)												
AUG., 1968 12...	1.0	.2	.6	--	46	35	21	6	50	6.7	55	19
04265453 - SOUTH INLET NEAR RAQUETTE LAKE, N.Y. (LAT 43 46 12 LONG 074 38 12)												
SEP., 1968 10...	1.0	.1	.4	--	30	28	11	4	34	6.3	26	15
04265465 - RAQUETTE RIVER NEAR DEERLAND, N.Y. (LAT 43 55 34 LONG 074 28 37)												
SEP., 1968 10...	1.1	.1	.3	--	19	23	11	6	32	6.5	8	19
04266850 - RAQUETTE RIVER TRIBUTARY NEAR STARK, N.Y. (LAT 43 28 57 LONG 074 44 35)												
JULY, 1968 22...	.9	.1	.9	--	44	21	14	9	36	6.3	80	26
04268400 - ST. REGIS RIVER NEAR PAUL SMITHS, N.Y. (LAT 44 25 49 LONG 074 20 00)												
JULY, 1968 16...	2.5	.1	1.4	--	41	33	20	6	50	6.4	10	23
04268510 - ST. REGIS RIVER NEAR SANTA CLARA, N.Y. (LAT 44 31 22 LONG 074 29 33)												
JULY, 1968 19...	1.0	.1	.6	--	50	31	20	6	47	6.4	50	24
04268710 - LAKE OZONIA OUTLET NEAR ST. REGIS FALLS, N.Y. (LAT 44 40 29 LONG 074 36 11)												
JULY, 1968 22...	1.0	.1	.8	--	51	32	22	7	48	6.6	85	21
04269200 - DEER RIVER NEAR DICKINSON CENTER, N.Y. (LAT 44 43 52 LONG 074 30 36)												
JULY, 1968 15...	1.3	.1	.5	--	50	33	22	6	53	6.8	45	24
04270050 - SALMON RIVER NEAR FAY, N.Y. (LAT 44 53 55 LONG 074 19 14)												
JULY, 1968 02...	1.8	.1	.3	--	72	58	44	8	94	7.4	25	20
04270700 - TROUT RIVER AT TROUT RIVER, N.Y. (LAT 44 59 23 LONG 074 17 56)												
JULY, 1968 11...	1.7	.1	.3	--	82	65	50	12	104	7.4	27	21
04276895 - WEST BROOK AT LAKE GEORGE, N.Y. (LAT 43 25 02 LONG 073 42 49)												
SEP., 1968 05...	1.8	.1	5.2	--	128	133	99	26	233	7.6	3	13
04277490 - SHELVEING ROCK BROOK AT SHELVEING ROCK, N.Y. (LAT 43 33 10 LONG 073 36 25)												
SEP., 1968 16...	.9	.1	.1	--	66	53	39	6	92	7.5	7	14
04278300 - NORTHWEST BAY BROOK NEAR BOLTON LANDING, N.Y. (LAT 43 39 48 LONG 073 36 14)												
AUG., 1968 27...	.7	.0	.2	--	63	62	48	8	110	7.4	4	--

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DISTANCE CHANGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DISTANCE CHANGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
STREAMS TRIBUTARY TO LAKE SUPERIOR							
04025500 BOIS BRULE RIVER AT BRULE (LAT 46 32 15 LONG 091 35 45)							
DEC. 8, 1966	0	140	118	DEC. 6, 1967	1	132	120
JAN. 10, 1967	0	146	60	JAN. 11, 1968	0	124	100
FEB. 14	0	125	100	FEB. 7	0	114	100
MAR. 22	3	137	140	MAR. 14	0	134	120
APR. 29	9	194	100	APR. 11	8	208	120
SEP. 27	9	125	120	MAY 14	12	213	105
NOV. 2	4	140	110	JULY 22	20	204	100
04027000 BAD RIVER NEAR ODANAH (LAT 46 29 15 LONG 090 41 45)							
DEC. 7, 1966	0	284	118	JAN. 10, 1968	0	90.2	260
JAN. 11, 1967	0	209	90	FEB. 6	0	119	240
MAR. 23	0	193	150	MAR. 13	0	184	130
APR. 14	6	2290	75	APR. 10	8	1410	100
MAY 2	7	1250	80	MAY 15	16	652	100
MAY 25	13	421	100	JULY 23	20	279	130
DEC. 5	0	216	120				
04027500 WHITE RIVER NEAR ASHLAND (LAT 46 29 50 LONG 090 54 15)							
DEC. 8, 1966	1	146	170	JAN. 11, 1968	0	167	140
JAN. 11, 1967	0	300	180	FEB. 6	0	328	140
FEB. 15	0	159	50	FEB. 14	0	165	180
MAR. 23	0	171	190	MAR. 12	1	160	130
APR. 30	7	161	155	APR. 10	9	412	135
SEP. 26	13	180	180	MAY 15	14	171	165
OCT. 31	4	154	175	JULY 24	20	160	180
DEC. 4	0	152	170				
04030000 MONTREAL RIVER NEAR SAXON (LAT 46 32 45 LONG 090 24 05)							
DEC. 7, 1966	1	198	75	NOV. 1, 1967	4	695	75
JAN. 12, 1967	0	193	120	DEC. 5	1	212	100
FEB. 16	0	121	50	JAN. 10, 1968	0	246	90
MAR. 24	0	171	120	FEB. 8	0	191	95
MAY 1	8	718	80	MAR. 12	0	235	100
JULY 26	22	297	100	APR. 10	10	598	140
AUG. 24	18	177	80	MAY 15	15	255	90
SEP. 26	14	200	80	JULY 23	22	180	90
STREAMS TRIBUTARY TO LAKE MICHIGAN							
04063700 POPPLE RIVER NEAR FENCE (LAT 45 45 50 LONG 088 27 50)							
DEC. 7, 1966	0	63.4	180	FEB. 23, 1968	0	38.6	140
AUG. 1, 1967	14	--	158	APR. 16	8	205	80
SEP. 20	17	--	105	APR. 29	7	227	80
OCT. 11	7	193	110	JUNE 10	19	--	140
04066000 MEMOMINEE RIVER NEAR PEMBINE (LAT 45 35 25 LONG 087 46 35)							
JAN. 6, 1967	0	--	215	JULY 10, 1968	18	3250	185
APR. 19	7	16500	115	AUG. 15	21	1930	205
FEB. 15, 1968	0	2460	240	SEP. 4	18	3130	210
APR. 8	4	2640	220				
04066500 PIKE RIVER AT AMBERG (LAT 45 29 50 LONG 087 59 40)							
DEC. 6, 1966	1	135	230	APR. 8, 1968	6	227	190
JAN. 6, 1967	0	111	240	APR. 30	6	274	200
SEP. 13	13	105	350	MAY 15	12	335	180
OCT. 13	7	158	220	JULY 9	19	285	200
JAN. 2, 1968	0	120	180	AUG. 15	15	126	240
JAN. 19	0	133	300	SEP. 3	14	204	235
FEB. 15	0	111	260				
04069500 PESHTIGO RIVER AT PESHTIGO (LAT 45 02 50 LONG 087 44 40)							
SEP. 13, 1967	18	494	380	MAR. 5, 1968	1	281	300
OCT. 12	10	409	270	APR. 9	8	1120	280
DEC. 29	1	427	380	JULY 11	21	854	320
FEB. 1, 1968	1	413	280	SEP. 25	18	884	280
04071000 OCONTO RIVER NEAR GILLET (LAT 44 51 55 LONG 088 18 00)							
DEC. 5, 1966	0	362	275	JAN. 12, 1968	0	333	280
JAN. 4, 1967	0	331	275	FEB. 14	0	303	300
APR. 18	9	2920	150	MAR. 14	0	421	280
MAY 23	10	--	220	APR. 9	7	691	220
AUG. 4	24	--	250	MAY 24	13	842	240
SEP. 27	11	350	250	AUG. 27	19	360	255
OCT. 24	10	385	280	SEP. 25	16	590	240
DEC. 20	0	406	280				
04073500 FOX RIVER AT BERLIN (LAT 43 57 15 LONG 088 57 10)							
JAN. 10, 1967	0	488	385	DEC. 11, 1967	1	1030	365
APR. 18	11	2250	340	JAN. 23, 1968	0	521	340
JUNE 8	20	648	360	MAR. 5	0	497	240
JULY 11	25	644	320	MAY 31	16	1240	350
AUG. 22	20	351	300	JULY 5	21	1890	360
OCT. 3	17	500	375	AUG. 2	22	771	350
NOV. 7	2	1120	320				

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued							
04074950 WOLF RIVER AT LANGLADE (LAT 45 11 15 LONG 088 44 00)							
DEC. 6, 1966	--	331	220	OCT. 19, 1967	8	394	160
JAN. 4, 1967	0	285	215	JAN. 10, 1968	0	250	200
FEB. 7	0	288	220	FEB. 14	0	248	220
AUG. 4	20	418	160	MAR. 12	0	373	220
SEP. 6	16	330	170	APR. 11	8	433	220
04075200 EVERGREEN CREEK NEAR LANGLADE (LAT 45 10 11 LONG 088 48 12)							
JAN. 10, 1968	0	11.2	300	MAR. 12, 1968	1	10.2	320
FEB. 13	0	8.36	300	APR. 11	10	9.40	300
FEB. 14	0	--	300	MAY 23	7	--	290
04077000 WOLF RIVER AT KESHENA FALLS (LAT 44 53 30 LONG 088 39 20)							
DEC. 6, 1966	1	532	260	FEB. 12, 1968	0	474	300
JAN. 4, 1967	0	507	240	MAR. 14	0	588	260
SEP. 6	16	577	220	APR. 10	8	709	220
OCT. 19	7	651	220	JUNE 25	17	1280	180
DEC. 21	1	620	300	AUG. 20	18	640	240
JAN. 11, 1968	0	446	200	SEP. 24	18	1050	240
04078500 EMBARRASS RIVER NEAR EMBARRASS (LAT 44 43 30 LONG 088 44 10)							
DEC. 5, 1966	0	97.2	400	DEC. 21, 1967	1	173	440
JAN. 3, 1967	0	106	420	JAN. 11, 1968	0	89.9	460
MAR. 28	1	--	140	MAR. 13	0	327	260
MAY 23	11	--	320	APR. 10	7	359	320
AUG. 4	23	--	385	JUNE 25	17	756	200
SEP. 5	20	108	360	SEP. 24	18	323	320
OCT. 24	9	134	380				
04079000 WOLF RIVER AT NEW LONDON (LAT 44 23 30 LONG 088 44 25)							
JAN. 11, 1967	0	831	160	DEC. 11, 1967	1	--	305
APR. 19	11	4680	240	JAN. 24, 1968	0	707	325
JUNE 7	21	1050	380	MAR. 6	0	632	320
JULY 12	23	2740	295	MAY 22	13	2960	260
AUG. 23	18	916	280	JUNE 18	19	1960	280
OCT. 4	15	850	300	JULY 24	22	2200	280
NOV. 7	2	2010	295	AUG. 22	24	1270	345
04080000 LITTLE WOLF AT ROYALTON (LAT 44 24 45 LONG 088 51 55)							
JAN. 11, 1967	0	199	265	DEC. 11, 1967	2	251	390
APR. 18	12	1210	300	JAN. 23, 1968	0	242	140
MAY 23	12	--	360	MAR. 5	0	185	400
JUNE 6	21	207	395	MAY 22	14	868	360
JULY 11	24	365	360	JUNE 18	19	280	240
AUG. 22	19	181	395	JULY 24	22	340	340
OCT. 3	16	173	400	AUG. 22	25	262	375
NOV. 7	3	270	355				
04085200 KEWAUNEE RIVER NEAR KEWAUNEE (LAT 44 27 30 LONG 087 33 23)							
FEB. 14, 1967	0	14.4	640	JAN. 16, 1966	0	16.7	600
MAR. 8	0	12.2	630	MAR. 26	8	58.0	540
JUNE 13	19	948	300	APR. 17	9	98.2	580
AUG. 15	24	11.0	435	MAY 20	13	70.6	665
SEP. 19	21	11.8	500	JUNE 17	19	24.6	570
OCT. 17	12	30.6	580	JULY 23	20	28.8	545
NOV. 14	4	38.6	610	AUG. 20	23	30.8	540
DEC. 19	1	39.0	585				
04086000 SHEBOYGAN RIVER AT SHEBOYGAN (LAT 43 44 25 LONG 087 45 35)							
DEC. 14, 1966	2	72.6	620	NOV. 15, 1967	2	121	610
JAN. 10, 1967	0	65.3	660	JAN. 9, 1968	0	33.0	910
FEB. 15	0	117.0	710	FEB. 15	0	60.4	650
MAR. 10	1	149	600	MAR. 20	1	190	440
MAR. 22	1	220	580	APR. 25	5	693	585
MAR. 29	3	934	430	JUNE 6	24	109	600
JULY 7	18	99.7	625	JULY 12	22	194	600
AUG. 8	23	39.6	590	AUG. 22	29	42.9	610
SEP. 13	19	35.5	580	SEP. 18	19	46.2	410
OCT. 11	9	46.2	700				
04086500 CEDAR CREEK NEAR CEDARBERG (LAT 43 19 25 LONG 087 58 50)							
DEC. 14, 1966	2	33.9	625	OCT. 20, 1967	8	10.8	750
JAN. 11, 1967	0	25.8	150	NOV. 15	1	32.2	760
FEB. 15	0	37.0	650	FEB. 15, 1966	0	14.2	570
MAR. 29	3	213	580	MAR. 13	0	19.9	510
APR. 25	11	65.2	640	APR. 23	12	194	630
JULY 7	19	22.8	600	APR. 24	6	279	710
AUG. 8	23	14.4	570	JUNE 7	28	30.1	640
SEP. 18	18	7.81	600	JULY 16	27	15.6	600
OCT. 11	7	9.29	720	AUG. 27	22	12.4	1200
OCT. 12	5	9.44	700	SEP. 16	22	7.24	900
04087000 MILWAUKEE RIVER AT MILWAUKEE (LAT 43 06 00 LONG 087 54 30)							
DEC. 6, 1966	1	161	1250	FEB. 16, 1968	0	106	760
FEB. 7, 1967	0	276	700	MAR. 25	7	217	510
MAR. 14	1	806	470	APR. 25	8	1510	840
JUNE 6	21	177	600	JUNE 10	26	164	590
AUG. 11	20	100	580	JULY 16	27	154	630
SEP. 12	19	66.1	640	JULY 30	24	144	650
OCT. 12	9	104	650	AUG. 24	28	156	420
NOV. 16	3	264	690	SEP. 24	21	314	460

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEM- PERATURE (°C)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)		DATE	WATER TEM- PERATURE (°C)	DIS- CHARGE (CFS)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)
		DIS- CHARGE (CFS)	CON- DUCTANCE (MICROMHOS AT 25°C)				
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued							
04087120 MEMONOME RIVER AT WAUWATOSA (LAT 43 02 44 LONG 087 59 59)							
DEC. 6, 1966	3	61.5	1600	JAN. 8, 1968	0	5.15	890
JAN. 6, 1967	2	18.3	1400	FEB. 16	0	12.6	1400
JAN. 17	0	11.8	2150	MAR. 25	9	17.1	1420
FEB. 24	0	19.3	1500	APR. 26	6	140	1300
MAR. 14	2	71.1	1150	JUNE 10	23	54.7	500
APR. 17	12	58.9	1100	JUNE 26	14	1130	690
APR. 25	6	49.6	1150	JUNE 26	14	1040	590
AUG. 11	17	17.6	880	JULY 17	25	27.3	1175
SEP. 12	17	11.4	950	JULY 30	23	22.1	1050
OCT. 12	9	12.6	1050	AUG. 24	25	28.3	800
NOV. 2	9	293	680	SEP. 24	20	229	620
NOV. 15	2	22.4	1250				
04087204 OAK CREEK AT SOUTH MILWAUKEE (LAT 42 55 30 LONG 087 52 15)							
DEC. 7, 1966	3	13.4	1260	OCT. 5, 1967	17	1.76	1500
JAN. 6, 1967	3	2.70	1600	NOV. 7	1	4.96	1500
JAN. 20	3	3.49	1700	DEC. 19	3	4.90	1690
FEB. 9	3	5.36	1800	JAN. 23, 1968	0	2.74	1200
FEB. 23	3	5.26	1900	MAR. 13	1	2.00	1800
MAR. 16	1	25.4	1100	APR. 10	13	3.25	1800
APR. 17	12	13.1	1300	MAY 26	15	8.84	1275
APR. 25	6	20.6	1150	JUNE 18	17	19.5	290
JUNE 5	19	2.51	1400	JUNE 27	14	439	390
JULY 18	22	3.69	1450	JULY 17	23	4.16	1500
AUG. 3	23	2.46	1500	AUG. 21	29	6.69	1600
AUG. 31	18	3.09	1250				
04087230 ROOT RIVER NEAR FRANKLIN (LAT 42 52 25 LONG 087 59 45)							
DEC. 7, 1966	1	41.9	1680	AUG. 31, 1967	17	9.88	950
JAN. 6, 1967	2	7.49	1000	OCT. 5	18	6.73	1675
JAN. 20	0	5.06	764	NOV. 8	1	13.2	1200
FEB. 9	3	15.3	1100	DEC. 18	3	16.0	1120
FEB. 23	2	11.8	1600	JAN. 23, 1968	1	6.42	1600
MAR. 14	1	79.3	875	MAR. 14	4	8.43	1100
MAR. 16	2	--	960	APR. 10	12	12.6	1200
APR. 14	14	33.1	1020	MAY 17	14	43.8	750
APR. 25	10	42.8	975	JUNE 19	20	163	480
JUNE 5	20	11.2	975	JULY 17	28	9.29	990
JUNE 13	23	294	700	JULY 30	23	15.9	950
JULY 19	19	10.3	950	AUG. 20	24	58.9	900
AUG. 3	24	12.8	920				
04087233 ROOT RIVER CANAL NEAR FRANKLIN (LAT 42 48 55 LONG 087 59 40)							
JAN. 6, 1967	2	3.20	1200	SEP. 1, 1967	14	2.31	1200
JAN. 20	0	2.21	955	OCT. 5	17	1.60	1300
FEB. 9	0	15.0	1050	NOV. 8	1	10.1	1175
FEB. 23	0	8.93	1100	DEC. 19	0	7.47	1125
MAR. 17	1	64.0	800	JAN. 24, 1968	0	5.17	1110
APR. 14	12	42.0	850	MAR. 14	0	3.60	1200
APR. 25	8	62.6	850	APR. 10	12	9.85	1120
MAY 18	9	28.3	860	MAY 17	12	12.0	1150
JUNE 5	19	6.91	850	JUNE 19	18	14.3	850
JUNE 13	25	557	620	JUNE 27	14	330	890
JUNE 27	17	24.2	875	JULY 18	23	20.9	960
JULY 19	19	5.93	1040	AUG. 20	26	12.5	960
AUG. 3	22	3.58	1040				
04087240 ROOT RIVER AT RACINE (LAT 42 45 05 LONG 087 49 25)							
DEC. 1, 1966	0	34.2	750	OCT. 5, 1967	17	9.26	1000
JAN. 6, 1967	2	16.3	1100	NOV. 7	0	51.0	1025
FEB. 10	0	47.0	1150	DEC. 19	1	27.9	1030
MAR. 15	0	352	650	JAN. 23, 1968	0	25.9	725
MAR. 16	0	--	690	MAR. 13	0	26.6	960
APR. 14	11	129	825	APR. 9	13	49.8	1050
APR. 26	8	194	825	MAY 17	16	118	1000
MAY 17	18	82.9	860	JUNE 19	17	50.6	950
JUNE 5	22	24.8	950	JUNE 20	18	166	820
JUNE 27	21	86.1	925	JULY 18	24	158	740
AUG. 4	23	20.6	850	AUG. 21	30	63.2	900
SEP. 1	19	21.2	900				

PERIODIC DETERMINATION OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
STREAMS TRIBUTARY TO LAKE SUPERIOR									
04025500 BOIS BRULE RIVER AT BRULE (LAT 46 32 15 LONG 091 35 45)									
OCT. 1, 1967	1200	125	7	2	MAY 14, 1968	1330	208	15	8
OCT. 27	0910	133	8	3	MAY 14	1345	208	12	7
MAR. 28 1968	1100	218	16	9	MAY 14	1400	208	18	10
APR. 11	1110	202	5	3	JUNE 17	2045	202	4	2
MAY 14	1200	208	10	6	JULY 22	1400	190	8	4
04026300 SIOUX RIVER NEAR WASHBURN (LAT 46 41 20 LONG 090 57 04)									
MAR. 28, 1968	1415	40	62	7	JUNE 18, 1968	1115	10	4	T
APR. 11	0745	22	12	1	JULY 22	1730	8.4	2	T
MAY 14	1800	12	6	T	AUG. 28	1420	7.9	4	T
04027000 BAD RIVER NEAR ODANAH (LAT 46 29 15 LONG 090 41 45)									
MAR. 28, 1968	1300	2520	430	2930	MAY 15, 1968	1515	635	23	39
MAY 15	1115	635	51	87					
STREAMS TRIBUTARY TO LAKE MICHIGAN									
04061000 BRULE RIVER NEAR FLORENCE (LAT 45 57 31 LONG 088 15 57)									
OCT. 5, 1967	0930	192	8	4	OCT. 17, 1967	0900	162	7	3
OCT. 9	0900	219	16	10	OCT. 25	0830	216	28	16
04063590 SOUTH BRANCH PINE RIVER NEAR ALVIN (LAT 45 53 45 LONG 088 49 55)									
APR. 5, 1968	1510	71.6	8	2					
04063592 NORTH BRANCH PINE RIVER NEAR ALVIN (LAT 45 55 44 LONG 088 51 38)									
APR. 5, 1968	1430	29.7	1	T					
04063600 PINE RIVER NEAR TIPLER (LAT 45 53 37 LONG 088 33 30)									
APR. 5, 1968	1220	230	2	1					
04083680 NORTH BRANCH POPPLE RIVER NEAR FENCE (LAT 45 45 LONG 088 27)									
APR. 5, 1968	0900	103	5	1					
04063690 SOUTH BRANCH POPPLE RIVER NEAR FENCE (LAT 45 45 LONG 088 27)									
APR. 5, 1968	0930	28	1	T					
04066500 PIKE RIVER AT AMBERG (LAT 45 29 50 LONG 088 27 50)									
OCT. 9, 1967	1130	140	4	2					
04072750 LAWRENCE CREEK NEAR WESTFIELD (LAT 43 53 52 LONG 089 34 52)									
NOV. 1, 1967	1330	16	42	2	FEB. 5, 1968	0815	12	16	1
NOV. 6	0930	15	47	2	FEB. 12	0620	16	16	1
NOV. 13	0750	15	53	2	FEB. 13	1045	16	6	T
NOV. 20	0800	16	47	2	FEB. 19	0745	16	17	1
NOV. 27	0750	15	59	2	FEB. 26	0800	15	7	T
NOV. 29	1240	15	18	1	MAR. 4	0800	15	8	T
DEC. 4	0750	15	55	2	MAR. 11	0815	15	6	T
DEC. 11	1105	16	62	3	MAR. 18	0800	15	17	1
DEC. 18	0930	15	60	2	MAR. 25	0805	15	12	T
DEC. 26	1045	15	50	2	APR. 1	0805	15	12	T
JAN. 2, 1968	0815	14	39	1	APR. 4	0730	18	73	4
JAN. 8	0830	14	18	1	APR. 6	1000	15	17	1
JAN. 8	1030	14	15	1	APR. 8	0754	16	11	T
JAN. 15	0815	12	15	T	APR. 15	0750	16	6	T
JAN. 22	0815	13	14	T	APR. 17	1155	25	10	1
JAN. 29	0820	13	46	2	APR. 22	0748	16	10	T
APR. 29,	0755	16	6	T	JULY 17,	1430	26	200	14
MAY 13	0805	15	7	T	JULY 20	1210	16	8	T
MAY 13	1315	15	17	1	JULY 22	0815	16	14	T
MAY 14	0735	17	8	T	JULY 29	0810	16	14	T
MAY 16	0810	22	6	T	AUG. 5	0820	18	7	T
MAY 20	0815	16	4	T	AUG. 12	0945	16	6	T
JUNE 3	0805	15	6	T	AUG. 19	0810	17	5	T
JUNE 10	0800	15	23	1	AUG. 22	1450	16	1	T
JUNE 17	0815	15	19	1	AUG. 26	0805	16	4	T
JUNE 21	1020	22	8	T	SEP. 3	0805	17	3	T
JUNE 24	0820	16	12	1	SEP. 9	0800	34	26	2
JUNE 26	1105	36	56	5	SEP. 9	1020	29	5	T
JULY 1	0805	16	17	1	SEP. 16	0755	17	15	1
JULY 8	0810	16	19	1	SEP. 23	0755	17	8	T
JULY 15	0820	16	11	T	SEP. 30	0810	17	4	T
04073050 GRAND RIVER NEAR KINGSTON (LAT 43 41 09 LONG 089 05 09)									
APR. 18, 1968	1105	62	78	13	AUG. 27, 1968	1200	55	11	2
JULY 9	1100	21	26	2	SEP. 20	1500	19	38	2
AUG. 20	1300	25	38	3					
04073500 FOX RIVER AT BERLIN (LAT 43 57 15 LONG 088 57 10)									
APR. 18, 1968	1300	1100	38	113					
T LESS THAN 0.50 TON.									

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN INDIANA

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)	DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)
STREAM, TRIBUTARY TO LAKE MICHIGAN									
04100500 ELKHART RIVER AT GOSHEN, IND. (LAT 41 35 36 LONG 085 50 55)									
Oct. 13, 1967	0920	144	33	13	Mar. 18....	1410	994	33	89
Nov. 9.....	1630	394	11	12	May 7.....	1210	440	102	121
Dec. 8.....	1030	630	9	15	June 27....	1325	2810	21	159
Feb. 12, 1968	1380	1380	6	22					

STREAMS TRIBUTARY TO LAKE ERIE

DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)	DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)
04182000 ST. MARYS RIVER NEAR FORT WAYNE, IND. (LAT 40 59 16 LONG 085 06 03)									
Oct. 1, 1967	1526	17	44	2.0	Nov. 6.....	1810	93	16	4.0
Oct. 2.....	1817	17	72	3.3	Nov. 7.....	1710	103	22	6.1
Oct. 3.....	1828	16	65	2.8	Nov. 8.....	1635	112	17	5.1
Oct. 4.....	1805	15	78	3.2	Nov. 9.....	1805	109	19	5.6
Oct. 5.....	1742	15	80	3.2	Nov. 10....	1725	103	11	3.1
Oct. 6.....	1652	15	74	3.0	Nov. 10....	1728	103	13	3.6
Oct. 7.....	1745	18	60	2.9	Nov. 11....	1720	98	18	4.8
Oct. 7.....	1800	18	53	2.6	Nov. 12....	1810	114	48	15
Oct. 8.....	1300	20	49	2.6	Nov. 13....	2123	88	54	13
Oct. 9.....	1700	23	60	3.7	Nov. 14....	1840	76	38	7.4
Oct. 10....	1821	25	48	3.2	Nov. 15....	1730	64	18	3.1
Oct. 11....	1812	22	38	2.3	Nov. 16....	1830	55	16	2.4
Oct. 12....	1800	22	33	2.0	Nov. 17....	1650	84	112	25
Oct. 13....	1840	20	37	2.0	Nov. 18....	1447	142	72	28
Oct. 14....	1340	17	48	2.2	Nov. 19....	2008	145	42	18
Oct. 15....	1340	16	60	2.6	Nov. 20....	1850	108	56	18
Oct. 16....	1820	19	34	1.7	Nov. 21....	1758	84	32	7.3
Oct. 17....	1815	34	51	4.7	Nov. 22....	1715	76	22	4.5
Oct. 18....	1830	52	96	13	Nov. 23....	1447	85	20	4.6
Oct. 19....	1830	42	52	5.9	Nov. 24....	2136	105	17	4.8
Oct. 20....	1730	39	34	3.6	Nov. 25....	1442	101	17	4.6
Oct. 21....	1825	29	46	2.0	Nov. 26....	1229	91	24	4.9
Oct. 22....	1800	23	31	1.9	Nov. 26....	1730	88	11	2.6
Oct. 23....	1805	20	41	2.2	Nov. 28....	1905	71	11	2.1
Oct. 25....	1845	22	58	3.4	Nov. 29....	1650	62	12	2.0
Oct. 25....	1730	34	29	2.7	Nov. 30....	1703	59	10	1.6
Oct. 27....	2110	34	44	4.0	Dec. 1.....	1710	66	9	1.6
Oct. 28....	1340	37	28	2.8	Dec. 2.....	1652	168	276	125
Oct. 29....	1350	30	26	2.1	Dec. 3.....	1751	2080	360	2020
Oct. 30....	1910	27	40	2.9	Dec. 3.....	2350	2300	306	1900
Oct. 31....	1709	26	60	4.2	Dec. 4.....	1703	2350	172	1090
Nov. 1.....	1747	40	54	5.8	Dec. 5.....	1803	1900	82	421
Nov. 2.....	1956	95	63	16	Dec. 6.....	1705	1980	104	556
Nov. 3.....	1745	131	48	17	Dec. 7.....	1805	2290	92	569
Nov. 4.....	1340	128	60	21	Dec. 8.....	1635	2560	87	601
Nov. 5.....	1305	118	36	11					

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN VERMONT

PERIODIC DETERMINATIONS OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)
STREAMS TRIBUTARY TO ST. LAWRENCE RIVER									
04282500 OTTER CREEK AT MIDDLEBURY									
OCT 10	1000		350	18	APR 30	0900		2040	36
NOV 21	1015		484	6	JUNE 5	1145		997	7
JAN 23	1000		350	3	JULY 16	1215		445	6
FEB 21	1135		250	4	AUG 27	1145	18	212	7
APR 2	0930		3680	28					
04288000 MAD RIVER NEAR MORETOWN									
OCT 4	1525		40	1	APR 23	0930		160	5
NOV 15	1525		147	1	MAY 28	1130		180	6
JAN 17	1615		93	2	JULY 10	1200		538	67
FEB 14	1000		115	1	AUG 13	1315	22	27	2
MAR 13	--		94	7					
04292500 LAMOILLE RIVER AT EAST GEORGIA									
OCT 15	1055		982	3	JUNE 26	1340	--	1180	9
JAN 14	1200		470	7	AUG 5	1540		230	4
APR 25	1700		8780	486	SEPT 18	1225	18	239	3
MAY 30	1030		519	8					
04293500 MISSISQUOI RIVER NEAR RICHFORD									
JAN 13	1515	0	300	5	JUNE 24	1250	13	604	7
FEB 21	1615	0	265	24	AUG 5	1140	22	151	4
APR 12	1500	--	1170	9	SEPT 17	1600	19	156	3
MAY 28	1630	--	401	8					

PERIODIC DETERMINATION OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
STREAMS TRIBUTARY TO LAKE MICHIGAN									
04080000 LITTLE WOLF RIVER AT ROYALTON (LAT 44 24 45 LONG 088 51 55)									
MAY 23, 1968	1600	676	10	18	AUG. 22, 1968	1330	262	2	1
JUNE 18	1545	280	8	6	SEP. 18	1140	322	2	2
JULY 24	1150	344	6	6					
04085200 KEWAUNEE RIVER NEAR KEWAUNEE (LAT 44 27 30 LONG 087 33 23)									
APR. 17, 1968	1040	95	36	9	AUG. 20, 1968	1145	31	9	1
MAY 20	1150	68	16	3	AUG. 21	1245	29	30	2
JUNE 14	1315	41	2	T	SEP. 16	1030	20	36	2
JULY 23	1130	29	26	2					
04086000 SHEBOYGAN RIVER NEAR SHEBOYGAN (LAT 43 44 25 LONG 087 45 35)									
OCT. 9, 1967	0815	34	50	5	SEP. 18, 1968	1520	46	9	1
OCT. 13	1500	45	60	7					
04086200 EAST BRANCH MILWAUKEE RIVER NEAR NEW FANE (LAT 43 33 01 LONG 088 11 18)									
JULY 15, 1968	1600	20	5	T	SEP. 23, 1968	1300	11	2	T
AUG. 23	1000	7.9	4	T					
04086340 NORTH BRANCH MILWAUKEE RIVER NEAR FILLMORE (LAT 43 28 58 LONG 088 03 39)									
AUG. 27, 1968	1000	16	102	4	SEP. 23, 1968	1720	40	36	4
SEP. 21	1100	87	114	27					
04086360 MILWAUKEE RIVER AT WAUBKA (LAT 43 28 22 LONG 087 59 23)									
JULY 15, 1968	1200	114	7	2	SEP. 23, 1968	1430	112	6	2
04086500 CEDAR CREEK NEAR CEDARBURG (LAT 43 19 25 LONG 087 58 50)									
APR. 23, 1968	1610	199	75	40	JULY 16, 1968	1200	16	14	1
APR. 24	1150	290	68	53	AUG. 27	1700	12	3	T
JUNE 7	1345	30	38	3	SEP. 16	1600	7.2	2	T
04087000 MILWAUKEE RIVER AT MILWAUKEE (LAT 43 06 00 LONG 087 54 30)									
AUG. 24, 1968	1000	158	45	19	SEP. 24, 1968	1600	313	32	27
04087120 MENOMONEE RIVER AT WAUWATOSA (LAT 43 02 44 LONG 087 59 59)									
SEP. 24, 1968	1800	228	485	299					
04087240 ROOT RIVER AT RACINE (LAT 42 45 05 LONG 087 49 25)									
MAY 17, 1968	1540	118	36	11	JULY 18, 1968	1245	143	160	62
JUNE 19	1110	51	74	10	AUG. 21	1410	63	98	17
T LESS THAN 0.50 TON.									

SASKATCHEWAN RIVER BASIN

05014500 SWIFTCURRENT CREEK AT MANY GLACIER, MONT.
(Hydrologic bench-mark station)

LOCATION.--Lat 48°48'10", long 113°39'20", in SE 1/4 sec.11, T.35 N., R.16 W. (unsurveyed), Glacier County, at gaging station at Swiftcurrent Lake outlet at Many Glacier, Glacier National Park, and 11 miles southwest of Babb.

DRAINAGE AREA.--31.4 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1968 (discontinued).
Water temperatures: October 1966 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 16.0°C July 28, 29, Aug. 3; minimum, freezing point on many days during November to March.

Period of record:

Water temperatures: Maximum, 18.0°C Aug. 15, 16, 18, 19, 1967; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Nov. 29 to Dec. 11.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SIU2)	IRON (FE)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLOUORIDE (F)
OCT. 23...	76	2.1	.07	13	3.9	.4	.4	55	0	.8	.6	.1
NOV. 01...	192	1.7	.10	13	3.6	.7	.5	52	0	2.5	.5	.1
FEB. 13...	30	2.6	.03	13	4.2	.7	.4	60	0	2.8	.3	.0
MAR. 28...	46	2.5	.06	14	4.2	.9	.2	63	0	2.0	.2	.2
MAY 02...	243	2.4	.06	12	3.4	.6	.4	56	0	2.3	.4	.0
30...	564	2.5	.06	13	4.7	.4	.4	59	0	1.3	.1	.0
JULY 03...	240	1.9	.16	13	3.7	.4	.4	57	0	3.3	.0	.1
31...	167	1.5	.03	12	3.5	.4	.2	58	0	2.0	1.0	.0
AUG. 30...	100	1.3	.04	13	4.1	.8	.2	62	0	4.5	.1	.1
SEPT. 30...	208	2.7	.00	14	4.1	.7	.2	60	0	2.5	.1	.1

DATE	NITRATE (NO3)	ORTHOPHOSPHATE (PO4)	DISSOLVED PHOSPHORUS AS PO4	BORON (B)	DISSOLVED SOLIDS (MGS) DUE AT 180 C	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH
OCT. 23...	.0	.02	.05	.01	46	.06	9.44	48	3	.0	94	6.7
NOV. 01...	.1	.04	.04	.02	52	.07	27.0	47	4	.0	97	7.1
FEB. 13...	.2	.08	.08	.01	56	.08	4.54	50	1	.0	102	7.5
MAR. 28...	.3	.06	.40	.00	56	.08	6.96	52	0	.1	100	7.6
MAY 02...	.0	.11	.11	.03	48	.07	31.5	44	0	.0	97	7.2
30...	.3	.05	.10	.01	48	.07	73.1	51	2	.0	98	7.4
JULY 03...	.3	.12	.26	.00	57	.08	36.9	47	0	.0	94	7.4
31...	.0	.15	.35	.04	62	.08	28.0	44	0	.0	96	7.4
AUG. 30...	.0	.03	.13	.01	69	.09	18.6	49	0	.0	114	7.5
SEPT. 30...	.1	.04	.12	.02	58	.08	32.6	52	2	.0	102	7.7

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

MONTH	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	AVERAGE			
OCTOBER	11	10	10	9	8	8	8	9	9	9	8	7	6	6	6	6	6	5	4	4	4	3	3	2	2	2	2	2	2	2	3	5			
MINIMUM	10	9	8	8	8	7	7	7	7	7	7	8	7	6	6	5	4	4	4	4	4	4	3	2	2	1	1	2	2	2	2	4			
NOVEMBER	2	2	2	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	1	1		
MINIMUM	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0		
DECEMBER	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
JANUARY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
FEBRUARY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MARCH	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
MINIMUM	0	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
APRIL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MINIMUM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MAY	6	5	6	6	5	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
MINIMUM	4	4	4	4	4	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
JUNE	7	8	7	7	7	6	6	7	8	8	8	8	8	8	8	8	8	8	9	9	10	9	9	9	9	10	10	10	10	10	9	9	9	9	8
MINIMUM	6	7	7	6	6	6	6	7	7	7	7	7	7	7	7	7	7	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8
JULY	10	11	12	13	13	13	13	15	14	13	14	14	12	12	12	12	12	13	13	13	12	12	12	12	12	12	14	13	14	16	14	14	14	13	13
MINIMUM	8	9	10	11	12	12	13	13	13	13	12	12	11	11	11	11	12	12	12	12	12	12	12	11	11	12	13	14	14	13	13	13	13	13	13
AUGUST	14	15	16	14	15	14	14	14	15	14	14	14	13	13	12	12	12	12	12	12	11	11	11	11	11	13	12	12	12	13	13	13	13	13	13
MINIMUM	13	13	14	14	14	14	14	14	14	13	13	13	13	13	13	12	12	11	11	11	11	10	10	10	10	10	10	11	10	11	11	12	12	12	12
SEPTEMBER	13	13	13	12	12	13	13	13	12	13	14	13	12	12	12	10	9	8	7	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7
MINIMUM	12	12	12	12	11	11	11	11	11	12	12	12	12	12	10	9	8	7	6	5	6	6	6	6	6	7	6	6	7	6	7	7	7	7	7

05053000 WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.

LOCATION.--46°28'05", long 96°47'00", in NE 1/4 sec.36, T.135 N., R.49 W., Richland County, at gaging station at county highway bridge, 0.8 mile upstream from rubble masonry dam, 3.2 miles northwest of Abercrombie, and 7 miles downstream from Antelope Creek.

DRAINAGE AREA.--2,060 sq mi, of which 590 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: August 1955 to June 1956, October 1966 to September 1968.
Water temperatures: October 1966 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 1,970 mg/l Mar. 1-6; minimum, 578 mg/l Mar. 27.

Hardness: Maximum, 1,120 mg/l Mar. 1-6; minimum, 303 mg/l Mar. 27.

Specific conductance: Maximum daily, 2,990 micromhos Feb. 24, 25, 29; minimum daily, 796 micromhos Apr. 1.

Water temperatures: Maximum, 26.0°C July 16; minimum, freezing point on many days during November to February.

Period of record:

Dissolved solids: Maximum, 2,030 mg/l Mar. 1, 1967; minimum, 162 mg/l June 15-19, 1967.

Hardness: Maximum, 1,120 mg/l Mar. 1-6, 1968; minimum, 110 mg/l June 15-19, 1967.

Specific conductance: Maximum daily, 2,990 micromhos Feb. 24, 25, 29, 1968; minimum daily, 169 micromhos June 16, 1967.

Water temperatures: Maximum, 26.0°C July 22, 1967, July 16; minimum, freezing point on many days during winter periods.

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN D15- CHARGE (CFS)	SILICA (SI02)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PD- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
OCT.												
01-31	.01	17	118	64	107	15	391	31	369	37	.4	.2
NOV.												
01-16	.15	29	123	68	112	15	458	15	376	39	.4	.7
17-30	2.0	29	135	78	157	17	513	0	497	68	.5	1.1
DEC.												
01-31	1.2	32	178	99	194	19	580	19	675	71	.5	1.1
JAN.												
01-26	.41	37	190	124	203	22	771	0	700	66	.7	.4
27...A	.40	40	222	129	213	22	801	45	740	71	.6	.6
28-31	.09	44	216	129	218	22	900	43	647	79	.6	3.6
FEB.												
01-29	.09	44	216	129	218	22	900	43	647	79	.6	3.6
MAR.												
01-06	.28	31	200	150	245	23	881	12	735	85	.6	5.1
07-11	6.4	31	165	92	179	17	600	20	497	77	.6	5.1
12-26	28	16	58	48	79	12	264	0	345	30	.2	4.8
27...B	32	10	68	33	56	9.4	164	0	261	20	.1	3.5
28-31	23	6.8	70	34	68	9.8	192	0	260	24	.1	.6
APR.												
01-08	23	6.8	70	34	68	9.8	192	0	260	24	.1	.6
09-14	76	5.3	78	37	76	9.6	179	0	311	30	.1	2.0
15-24	46	2.6	80	45	94	11	221	0	343	34	.3	.5
25-30	105	9.7	110	60	135	14	300	0	478	48	.3	.8
MAY												
01-04	105	9.7	110	60	135	14	300	0	478	48	.3	.8
05-18	59	14	130	79	196	16	392	0	645	62	.4	.5
19...C	47	17	135	84	188	14	430	0	630	59	.4	.6
20-31	28	16	143	95	210	19	456	0	688	73	.7	1.4
JUNE												
01-10	14	14	140	92	240	17	481	0	770	72	.4	.7
11-19	43	15	105	71	164	14	386	0	535	48	.5	1.4
20-30	23	17	103	68	122	13	387	0	444	26	.2	1.5
JULY												
01-07	12	17	100	69	155	15	409	0	480	58	.5	1.2
08-22	4.1	19	115	77	195	16	441	0	580	61	.5	.9
23-31	2.1	26	121	77	212	17	443	0	627	69	.6	.8
AUG.												
01-31	2.1	26	121	77	212	17	443	0	627	69	.6	.8
SEPT.												
01-24	.02	20	111	80	212	18	435	0	630	66	.5	.2
25-30	15	19	90	62	180	15	364	0	494	68	.5	.6
WTD. AVG. TIME	--	12	108	63	141	14	328	0	486	47	.3	1.3
WTD. AVG. TONS	14	24	136	83	171	17	492	9	551	58	.5	1.3
PER DAY	--	.5	4.1	2.4	5.3	.5	12	0	18	1.8	.0	.0

A INCLUDES 1.01 MG/L IRON (FE) AND 4.20 MG/L MANGANESE (MN).

B INCLUDES 0.04 MG/L IRON (FE) AND 4.20 MG/L MANGANESE (MN).

C INCLUDES 0.05 MG/L IRON (FE) AND 0.04 MG/L MANGANESE (MN).

RED RIVER OF THE NORTH BASIN

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHO-PHOSPHATE (PP4)	BORON (B)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
OCT. 01-31	--	.36	998	1.36	.03	556	184	2.0	1350	8.6	18
NOV. 01-16	--	.33	1050	1.43	.43	587	186	2.0	1410	8.4	2
17-30	--	.40	1310	1.78	7.07	656	235	2.7	1710	8.1	27
DEC. 01-31	--	.46	1660	2.26	5.38	850	343	2.9	2060	8.5	25
JAN. 01-26	--	.52	1760	2.39	1.95	986	353	2.8	2220	8.1	--
27...	--	.52	1900	2.58	2.05	1080	353	2.8	2370	8.4	--
28-31	--	.54	1880	2.56	.46	1070	259	2.9	2380	8.3	--
FEB. 01-29	--	.54	1880	2.56	.46	1070	259	2.9	2380	8.3	--
MAR. 01-06	--	.56	1970	2.68	1.49	1120	377	3.2	2550	8.3	23
07-11	--	.40	1430	1.94	24.7	790	264	2.8	1930	8.4	15
12-26	--	.26	809	1.10	61.2	441	224	1.6	1120	7.9	18
27...	.22	.14	578	.79	49.9	303	168	1.4	828	7.8	--
28-31	--	.19	601	.82	37.3	314	156	1.7	873	8.1	10
APR. 01-08	--	.19	601	.82	37.3	314	156	1.7	873	8.1	10
09-14	--	.19	675	.92	13.9	347	200	1.8	963	8.0	15
15-24	--	.24	794	1.08	98.6	385	204	2.1	1110	8.1	18
25-30	--	.31	1100	1.50	31.2	521	275	2.6	1470	7.7	28
MAY 01-04	--	.31	1100	1.50	31.2	521	275	2.6	1470	7.7	28
05-18	--	.43	1430	1.94	22.8	649	327	3.3	1860	7.5	34
19...	.72	.44	1460	1.99	185	682	329	3.1	1900	7.9	22
20-31	--	.46	1580	2.15	11.9	746	372	3.3	2090	8.0	23
JUNE 01-10	--	.37	1640	2.23	62.0	728	334	3.9	2110	7.8	8
11-19	--	.44	1230	1.67	143	555	239	3.0	1640	7.8	20
20-30	--	.40	1050	1.43	65.2	537	219	2.3	1420	7.7	26
JULY 01-07	--	.47	1140	1.55	36.9	533	198	2.9	1570	7.8	25
08-22	--	.52	1370	1.86	15.2	604	243	3.5	1840	8.0	17
23-31	--	.63	1440	1.96	8.16	617	253	3.7	1910	8.0	28
AUG. 01-31	--	.63	1440	1.96	8.16	617	253	3.7	1910	8.0	28
SEPT. 01-24	--	.60	1420	1.93	.08	604	247	3.8	1900	8.0	26
25-30	--	.49	1190	1.62	48.2	479	181	3.6	1630	7.8	31
WTD. AVG. TIME	--	.35	1110	--	--	529	259	--	1490	7.8	--
WTD. AVG. TONS PER DAY	--	.45	1360	1.89	42.0	679	260	2.9	1780	8.1	--
	--	.01	--	--	--	--	--	--	--	--	--

OAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	YEAR OCTOBER 1967	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	1370	1380	2040	2260	2470	2850	796	1490	2140	1440	1920	1980
2.....	1360	1380	2150	2050	2650	2730	818	1640	2130	1450	1960	1980
3.....	1350	1390	2150	2280	2590	2920	869	1820	2130	1590	1950	1980
4.....	1350	1390	2090	2380	2450	2870	925	1920	2140	1600	1940	1960
5.....	1360	1380	2090	2380	2510	2750	976	1740	2140	1600	1910	1990
6.....	1370	1430	2160	2010	2510	2530	979	1850	2140	1650	1910	1960
7.....	1360	1450	1880	2170	2490	2540	979	1950	2130	1680	1900	1960
8.....	1350	1460	1950	2340	2510	2400	948	1940	2090	1750	1910	1960
9.....	1350	1460	1960	2340	2530	2170	940	1920	2080	1760	1920	1980
10.....	1350	1440	2060	2310	2610	1480	1140	1940	1980	1790	1910	1980
11.....	1350	1410	2060	2380	2610	1660	943	1930	1940	1830	1910	1960
12.....	1360	1400	--	2410	2610	1660	905	1880	1700	1830	1910	1980
13.....	1360	1400	2120	2190	2670	2000	871	1900	1300	1860	1920	1980
14.....	1350	1400	2150	2410	2690	1380	988	1940	1300	1900	1930	1980
15.....	1350	1410	2260	2130	2650	1360	971	1940	1670	1930	1900	1990
16.....	1360	1420	2260	2160	2720	1150	971	1710	1760	1820	1900	1960
17.....	1360	1430	2230	2490	2760	891	948	1800	1750	1900	1900	1950
18.....	1370	1420	2230	2470	2810	855	997	1860	1750	1880	1910	1930
19.....	1380	1450	1940	2430	2810	853	1060	1890	1460	1870	1900	1930
20.....	1370	1500	2200	2500	2810	820	1120	2020	1300	1860	1910	1930
21.....	1370	1520	2090	2260	2790	840	1230	2060	1320	1860	1900	1930
22.....	1380	1600	2110	2360	2940	906	1250	2080	1240	1860	1920	1860
23.....	1400	1720	2250	2160	2940	920	1280	2080	1550	1860	1920	1860
24.....	1420	1780	2260	2360	2990	918	1340	2120	1550	1850	1920	1860
25.....	1420	1670	2160	2330	2990	920	1280	2110	1510	1850	1940	1870
26.....	1470	1910	2160	2280	2960	814	1290	2140	1430	1840	1960	1850
27.....	1420	2180	2190	2450	2960	810	1330	2160	1400	1850	1950	1850
28.....	1420	2300	2190	2170	2740	820	1410	2150	1430	1840	1980	1760
29.....	1420	2310	2060	2170	2990	820	1350	2160	1460	1850	1980	1470
30.....	1420	2080	2220	2230	--	818	1250	2160	1440	1850	1920	1640
31.....	1420	--	2260	2310	--	808	--	2160	--	1860	1920	--
AVERAGE	1380	1580	2130	2300	2720	1520	1070	1950	1710	1790	1920	1910

05053000 WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.,--Continued
TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.5	4.5	0.5	0	0	0.5	6.5	15.5	17.0	17.0	21.0	19.5
2	13.5	4.0	0.5	0	0	0.5	6.5	15.5	19.0	16.0	21.0	17.5
3	12.0	2.5	1.0	0	0.5	0.5	5.0	15.5	19.5	17.5	21.5	17.5
4	14.5	1.5	1.0	0	0	0.5	1.5	12.0	19.5	17.5	22.0	16.5
5	12.5	4.0	1.0	0	0.5	0.5	2.0	11.5	21.0	20.5	22.5	16.5
6	12.0	4.0	0.5	0	0.5	0.5	3.5	11.0	21.0	21.5	24.0	17.0
7	10.5	2.5	0.5	0	0.5	1.0	4.0	10.5	21.5	22.5	24.0	17.0
8	9.0	4.0	0.5	0	0.5	1.5	4.5	13.0	22.0	24.0	24.0	16.0
9	8.5	3.5	1.0	0	0	1.0	4.5	10.0	21.5	21.5	22.5	15.5
10	6.0	4.5	1.0	0	0	1.0	7.0	12.0	21.0	21.0	21.0	17.0
11	6.0	4.5	1.0	0	0	0.5	11.0	12.0	20.5	22.5	20.5	19.0
12	7.0	2.5	0.5	0	0	0.5	11.0	11.5	18.5	23.5	21.0	19.0
13	7.0	3.5	0.5	0.5	0	0.5	6.5	13.5	18.5	24.5	20.0	19.5
14	9.0	2.5	3.5	0	0	0.5	5.5	15.5	17.5	24.0	18.5	20.0
15	7.5	2.0	0.5	0	0	0.5	6.0	15.0	17.0	25.0	17.5	20.0
16	9.5	2.5	0.5	0.5	0	0.5	7.5	11.5	16.0	26.0	17.5	20.0
17	9.0	3.5	0.5	0.5	0	1.0	10.0	10.0	16.5	25.5	18.5	18.5
18	7.5	2.5	0.5	0	0	1.0	10.0	9.0	17.0	24.5	17.5	16.0
19	7.0	2.5	0.5	0.5	0	1.0	9.5	9.0	20.0	24.0	18.5	16.0
20	7.0	2.5	0.5	0.5	0	0.5	9.5	10.0	20.5	24.0	20.0	15.5
21	6.5	2.5	0	0.5	0	0.5	10.5	10.0	24.0	24.0	20.5	15.5
22	7.0	2.5	0	0.5	0	0.5	9.0	15.0	21.5	22.5	21.5	16.5
23	7.0	2.0	0.5	0	0	0.5	6.5	15.5	21.0	22.0	22.0	16.5
24	6.5	2.5	0.5	0.5	0	1.0	5.5	15.5	21.0	22.0	21.0	15.5
25	6.5	3.5	0.5	0.5	0	1.0	7.5	15.5	20.5	22.5	19.0	14.5
26	6.0	1.0	0.5	0.5	0.5	1.5	7.0	15.5	20.5	23.5	19.5	14.0
27	5.5	1.0	0	0.5	0.5	1.5	7.0	15.0	19.5	22.0	19.5	14.0
28	5.0	0.5	0	0.5	0.5	1.5	9.0	15.5	20.0	21.0	20.5	15.0
29	4.5	0	0.5	0	0.5	2.5	12.0	15.5	20.5	21.0	20.0	13.5
30	4.5	0.5	0	0	---	4.5	15.5	17.5	19.0	21.5	19.5	14.5
31	4.0	---	0.5	0	---	6.0	---	---	17.0	---	19.5	---
AVERAGE	8.0	2.5	0.5	0	0	1.0	7.5	13.0	20.0	22.0	20.5	16.5

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

LOCATION.--Lat 46°51'40", long 96°47'00", in R4NE1 sec.18, T.139 N., R.48 W., Cass County, at gaging station at city waterplant on 4th St. S. in Fargo, 25 miles upstream from mouth of Sycamore River, and at mile 453.

DRAINAGE AREA.--6,800 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1955 to September 1968.

Water temperatures: October 1955 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 409 mg/l Apr. 25 to May 18; minimum, 251 mg/l Sept. 1-25.

Hardness: Maximum, 304 mg/l Feb. 1-29, 1958; minimum, 214 mg/l Dec. 1-25, Sept. 26-30, 1958.

Specific conductance: Maximum daily, 694 micromhos May 3; minimum daily, 306 micromhos Dec. 3.

Water temperatures: Maximum, 26.0°C on several days during July; minimum, 2.0°C on many days during November to March.

Period of Record:

Dissolved solids (1955-58, 1959-68): Maximum, 650 mg/l May 6-9, 1958; minimum, 174 mg/l Dec. 1, 2, 1955.

Hardness: Maximum, 420 mg/l May 6-9, 1958; minimum, 118 mg/l Apr. 6-17, 1962.

Specific conductance: Maximum daily, 960 micromhos May 6, 1958; minimum daily, 223 micromhos Apr. 11, 1962.

Water temperatures: Maximum, 26.0°C on several days in 1957, 1960, and 1964; minimum, 1.0°C on many days in 1956 and 1959.

REMARKS.--Daily samples for chemical analysis composited by discharge. Water temperature, measured in waterplant, modified slightly in transit.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN OI5-CHARGE (CF5)	SILICA (SiO2)	CALCIUM (CA)	NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	8ICAR-BONATE (MCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLO-RICE (CL)	FLUD-RICE (F)	NITRATE (NB3)
OCT												
01-27	167	---	---	---	10	---	273	0	36	---	---	---
28...A	208	2.9	4.6	31	10	4.9	273	2	29	4.4	.3	.0
29-31	164	---	---	---	10	---	278	0	31	---	---	---
NOV												
01-30	164	---	---	---	10	---	278	0	31	---	---	---
DEC.												
01-25	169	---	---	---	13	---	229	0	41	---	---	---
26...B	148	11	38	37	14	4.9	262	9	48	5.0	.3	.0
27-31	137	---	---	---	13	---	328	0	40	---	---	---
JAN.												
01-31	137	---	---	---	13	---	328	0	40	---	---	---
FEB.												
01-29	135	---	---	---	14	---	344	0	36	---	---	---
MAR.												
01-25	342	---	---	---	17	---	283	0	62	---	---	---
26...C	496	11	45	26	15	4.8	207	0	68	6.1	.1	1.3
27-31	416	---	---	---	14	---	216	0	65	---	---	---
APR.												
01-11	416	---	---	---	14	---	216	0	65	---	---	---
12-17	598	---	---	---	20	---	220	0	101	---	---	---
18-24	463	---	---	---	22	---	228	0	118	---	---	---
25-30	675	---	---	---	25	---	254	0	114	---	---	---
MAY												
01-18	675	---	---	---	20	---	254	0	114	---	---	---
19...D	772	7.8	52	34	25	2.0	256	0	106	8.6	.2	.3
20-31	649	---	---	---	20	---	257	0	77	---	---	---
JUNE												
01-30	649	---	---	---	20	---	257	0	77	---	---	---
JULY												
01-08	578	---	---	---	13	---	243	0	45	---	---	---
09-31	386	---	---	---	10	---	252	0	30	---	---	---
AUG.												
01-31	223	---	---	---	10	---	252	0	27	---	---	---
SEPT.												
01-25	141	---	---	---	8.9	---	250	0	29	---	---	---
26-30	233	5.9	41	27	10	4.1	248	0	35	4.0	.1	.1
WTD. AVG.	---	---	---	---	16	---	259	0	64	---	---	---
TIME												
WTD. AVG.	315	---	---	---	14	---	269	0	51	---	---	---
TONS												
PER DAY	---	---	---	---	14	---	220	0	55	---	---	---

A INCLUDES 0.13 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).

B INCLUDES 0.05 MG/L IRON (FE).

C INCLUDES 0.08 MG/L IRON (FE) AND 0.07 MG/L MANGANESE (MN).

D INCLUDES 0.03 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).

RED RIVER OF THE NORTH BASIN

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHOPHOSPHATE (PO4)	BORON (B)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
OCT.											
01-27	--	--	276	.38	124	244	20	.3	469	7.8	--
28...	.10	.06	278	.38	156	243	16	.3	474	8.3	--
29-31	--	--	276	.38	122	240	11	.3	467	7.8	--
NOV.											
01-30	--	--	276	.39	122	240	11	.3	467	7.8	--
DEC.											
01-25	--	--	254	.35	116	214	26	.4	436	7.9	--
26...	--	.59	316	.43	126	245	15	.4	523	8.5	--
27-31	--	--	341	.46	126	291	22	.3	565	7.7	--
JAN.											
01-31	--	--	341	.46	126	291	22	.3	565	7.7	--
FEB.											
01-29	--	--	357	.49	130	304	22	.3	586	7.9	--
MAR.											
01-25	--	--	341	.46	315	271	39	.4	560	7.6	--
27...	.58	.06	286	.39	383	219	49	.4	471	7.8	--
27-31	--	--	291	.40	327	222	44	.4	472	7.9	--
APR.											
01-11	--	--	291	.40	327	222	44	.4	472	7.9	--
12-17	--	--	347	.47	560	253	72	.5	551	7.7	--
18-24	--	--	381	.52	476	276	88	.6	599	7.7	--
25-30	--	--	409	.56	745	291	83	.6	626	7.6	+
MAY											
01-18	--	--	409	.56	745	291	83	.6	626	7.6	--
19...	.33	.08	378	.51	788	269	59	.7	594	7.5	8
20-31	--	--	346	.47	606	262	51	.5	549	7.7	--
JUNE											
01-30	--	--	346	.47	606	262	51	.5	549	7.7	--
JULY											
01-08	--	--	274	.37	428	228	29	.4	464	7.9	--
09-31	--	--	269	.37	280	220	13	.3	441	7.9	--
AUG.											
01-31	--	--	252	.34	152	217	11	.3	426	7.8	--
SEPT.											
01-25	--	--	251	.34	95	227	22	.3	433	7.7	--
26-30	--	.09	265	.36	167	214	11	.3	445	7.8	--
MTD. AVG. TIME PER DAY	--	--	325	--	--	255	42	--	525	7.7	--
MTD. AVG. TONS PER DAY	--	--	308	.42	276	252	31	.4	507	7.8	--

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.5	5.5	2.5	1.5	1.5	1.5	3.5	12.5	17.0	20.5	22.0	19.5
2	15.0	6.0	2.0	1.5	1.5	1.5	4.5	15.0	17.5	19.5	22.0	19.5
3	15.0	6.0	2.0	1.5	1.5	1.5	5.5	15.5	18.5	19.5	23.5	19.5
4	15.5	6.0	2.0	1.5	1.5	1.5	5.0	15.5	20.0	20.0	23.5	19.0
5	15.0	5.5	2.0	1.5	1.5	2.0	5.0	15.0	20.5	20.5	24.0	18.5
6	14.5	5.0	2.0	1.0	1.5	2.0	4.5	14.5	20.5	21.0	24.5	17.5
7	14.0	4.5	2.0	1.5	1.5	2.0	5.0	13.5	21.0	21.0	25.0	18.5
8	14.0	4.5	2.5	1.5	1.5	2.0	6.0	13.5	20.5	22.5	24.5	18.5
9	12.0	3.5	2.5	1.5	1.5	2.0	6.5	11.5	20.5	23.5	24.0	17.5
10	12.0	4.0	2.5	1.5	1.5	1.5	7.0	12.0	22.0	23.5	23.5	17.5
11	12.0	4.5	2.5	1.5	1.5	2.0	8.5	13.5	22.0	23.5	23.5	17.0
12	11.0	4.5	2.5	1.5	1.5	2.0	9.5	14.0	21.0	24.0	22.5	17.5
13	11.0	4.5	2.5	1.5	1.5	2.0	9.5	14.0	21.0	24.0	22.5	18.5
14	11.5	4.0	2.0	1.5	1.5	2.0	9.5	15.0	21.0	24.0	21.0	19.0
15	11.0	4.0	1.5	1.5	1.5	2.0	9.5	15.5	21.0	25.5	21.0	19.5
16	11.0	3.5	2.0	1.5	1.5	2.0	10.5	14.5	21.0	26.0	21.0	19.5
17	11.0	3.5	2.0	1.5	1.5	2.0	11.5	12.0	20.0	26.0	20.0	19.5
18	10.5	3.5	2.0	1.5	1.5	2.5	10.0	12.5	20.5	26.0	19.0	19.0
19	10.5	3.5	2.0	1.5	1.5	2.0	11.0	12.5	20.0	25.5	20.0	19.0
20	9.5	4.0	2.0	1.5	1.5	2.0	11.0	12.0	20.5	25.5	20.5	19.0
21	10.0	4.0	2.0	1.5	1.5	1.5	11.0	12.5	21.0	25.5	20.5	19.0
22	10.0	3.5	2.0	1.5	1.5	1.5	11.5	13.5	21.0	24.5	21.5	19.5
23	9.5	3.5	2.0	1.5	1.5	1.5	10.0	14.0	21.0	24.5	22.0	19.0
24	9.5	2.5	2.0	1.5	1.5	1.5	9.5	14.5	21.5	24.0	23.5	17.5
25	9.0	2.5	2.0	1.5	1.5	2.0	9.0	14.5	21.0	24.0	22.0	17.0
26	7.0	2.5	2.0	1.5	1.5	2.0	9.5	15.0	20.5	24.0	21.0	15.5
27	6.5	2.5	2.0	1.5	1.5	2.0	9.5	16.0	20.5	24.0	20.5	15.5
28	6.5	2.5	1.5	1.5	1.5	2.0	9.5	16.5	20.5	24.0	20.0	15.5
29	6.0	2.5	1.5	1.5	1.5	2.0	10.5	16.5	21.0	23.5	21.0	15.0
30	5.0	2.0	1.5	1.5	1.5	2.0	11.5	16.0	21.0	23.5	20.5	15.5
31	5.5	---	1.5	1.5	---	2.5	---	17.0	---	22.5	20.0	---
AVERAGE	11.0	4.0	2.0	1.5	1.5	2.0	8.5	14.0	20.5	23.5	22.0	18.0

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	496	462	419	551	594	585	443	694	541	465	405	427
2.....	496	459	347	551	586	586	451	632	533	436	400	423
3.....	489	459	306	556	577	588	449	678	528	464	398	425
4.....	501	459	307	556	586	592	476	690	530	472	412	425
5.....	529	462	401	567	584	572	503	690	530	466	400	425
6.....	546	462	375	576	580	567	496	668	527	458	402	437
7.....	527	460	396	567	576	551	471	680	525	454	401	427
8.....	469	460	402	564	578	539	478	640	531	454	397	427
9.....	439	460	380	564	589	533	486	628	538	447	408	427
10.....	439	459	415	573	579	537	483	620	528	442	434	425

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

DAY	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968											
	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
11.....	443	454	446	568	563	578	479	614	528	438	438	419
12.....	447	459	475	568	577	611	502	620	528	439	440	419
13.....	449	457	417	566	589	529	470	594	535	439	435	425
14.....	448	463	425	564	586	522	490	604	510	450	448	423
15.....	449	466	428	564	588	498	578	595	580	433	465	421
16.....	452	468	358	577	588	487	593	605	582	430	420	414
17.....	452	473	375	581	580	480	593	624	576	424	409	414
18.....	446	477	428	575	581	531	618	621	547	424	425	420
19.....	446	477	420	576	578	568	602	610	561	442	422	428
20.....	446	462	426	582	570	651	575	605	567	455	418	430
21.....	449	467	483	574	568	566	594	583	538	443	418	436
22.....	451	462	438	587	572	556	604	580	518	434	416	411
23.....	455	474	482	580	565	564	576	604	507	434	409	416
24.....	456	472	454	580	581	508	576	595	528	434	408	426
25.....	458	474	380	575	579	495	584	579	533	434	405	427
26.....	460	481	438	584	583	469	528	593	517	436	408	437
27.....	461	483	426	587	588	451	538	606	563	428	418	444
28.....	464	496	486	598	585	479	532	595	511	425	414	444
29.....	464	501	425	586	576	446	607	559	495	414	422	427
30.....	464	496	442	579	--	419	666	556	453	409	414	426
31.....	461	--	380	576	--	419	--	547	--	409	421	--
AVERAGE	466	468	409	572	580	531	534	616	530	439	417	425

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 at highway bridge, 3.3 miles south of Warwick.

DRAINAGE AREA.--2,070 sq mi, approximately, of which about 1,310 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: January 1951 to September 1968.

Water temperatures: January 1951 to September 1962, October 1963 to September 1964, October 1965 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 687 mg/l May 26 to June 8; minimum, 237 mg/l Mar. 23-31.

Hardness: Maximum, 338 mg/l Mar. 1-4; minimum, 112 mg/l Mar. 23-31.

Specific conductance: Maximum daily, 1,080 micromhos Nov. 14; minimum daily, 322 micromhos Mar. 28.

Water temperatures: Maximum, 27.0°C July 7; minimum, 1.0°C on several days during November to April.

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, 192 micromhos Mar. 18, 1963.

Water temperatures: Maximum (1951-55, 1956-62, 1963-64, 1965-68), 30.0°C July 21, 1955; minimum, freezing point on many days during winter periods.

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS- CHARGE (CF5)	SILICA (SiO2)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PQ- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
OCT.												
01-25	3.1	--	--	--	40	--	262	0	--	--	--	--
26--A	4.1	14	50	18	54	4.2	280	0	75	7.2	.0	.1
27-31	3.9	--	--	--	106	--	381	0	--	--	--	--
NOV.												
01-30	3.9	--	--	--	106	--	381	0	--	--	--	--
DEC.												
01-26	2.4	--	--	--	72	--	378	0	--	--	--	--
27--B	3.5	27	60	22	35	5.1	307	0	59	7.5	.2	.1
28-31	2.3	--	--	--	50	--	276	0	--	--	--	--
JAN.												
01-31	2.3	--	--	--	50	--	276	0	--	--	--	--
FEB.												
01-29	2.5	--	--	--	50	--	392	0	--	--	--	--
MAR.												
01-04	3.8	--	--	--	56	--	423	0	--	--	--	--
05-06	27	--	--	--	58	--	416	0	--	--	--	--
07-09	86	--	--	--	29	--	215	0	--	--	--	--
10-13	169	--	--	--	75	--	264	0	--	--	--	--
14-22	89	--	--	--	30	--	156	0	--	--	--	--
23-31	114	--	--	--	28	--	136	0	--	--	--	--
APR.												
01-30	27	--	--	--	45	--	224	0	--	--	--	--
MAY												
01-18	33	--	--	--	73	--	353	0	--	--	--	--
19--C	60	10	65	32	77	10	365	0	133	17	.4	1.0
20-25	37	--	--	--	87	--	388	0	--	--	--	--
26-31	12	--	--	--	110	--	420	0	--	--	--	--
JUNE												
01-08	12	--	--	--	110	--	420	0	--	--	--	--
09-18	20	--	--	--	108	--	432	0	--	--	--	--
19-30	9.8	--	--	--	93	--	393	0	--	--	--	--
JULY												
01-14	7.7	2.1	45	35	95	7.2	369	0	134	16	.4	.7
15-28	4.4	--	--	--	83	--	327	0	--	--	--	--
29-31	2.4	--	--	--	63	--	280	0	--	--	--	--
AUG.												
01-18	2.4	--	--	--	63	--	280	0	--	--	--	--
19-31	12	--	--	--	70	--	278	0	--	--	--	--
SEPT.												
01-10	12	--	--	--	70	--	278	0	--	--	--	--
11-15	5.6	--	--	--	71	--	268	0	--	--	--	--
16-24	18	4.2	30	26	61	5.6	270	0	88	12	.3	.6
25-30	6.1	--	--	--	61	--	275	0	--	--	--	--
WTO. AVG.	--	--	--	--	57	--	258	0	--	--	--	--
TIME												
WTO. AVG.	16.9	--	--	--	68	--	318	0	--	--	--	--
TONS												
PER DAY	--	--	--	--	2.6	--	12	0	--	--	--	--

A INCLUDES 0.09 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).

B INCLUDES 0.07 MG/L IRON (FE).

C INCLUDES 0.03 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHOPHOSPHATE (PO4)	BORON (B)	DISSOLVED SILICATES (RESIDUE AT 180 C)	DISSOLVED SILICATES (TONS AC-FT)	DISSOLVED SILICATES (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
OCT.											
01-25	--	--	332	.45	2.78	200	0	1.2	538	7.6	--
26...	.13	.07	362	.49	4.01	200	0	1.7	584	8.0	--
27-31	--	--	546	.74	5.75	233	0	3.0	846	8.2	--
NOV.											
01-30	--	--	546	.74	5.75	233	0	3.0	846	8.2	--
DEC.											
01-26	--	--	493	.67	3.19	269	0	1.9	756	7.9	--
27...	--	.08	410	.56	3.87	241	0	1.0	617	8.2	--
28-31	--	--	423	.58	2.63	205	0	1.5	585	7.8	--
JAN.											
01-31	--	--	423	.58	2.63	205	0	1.5	585	7.8	--
FEB.											
01-29	--	--	485	.66	3.27	310	0	1.2	741	8.0	--
MAR.											
01-04	--	--	544	.74	5.58	336	0	1.3	817	8.0	--
05-06	--	--	556	.76	40.5	327	0	1.4	799	8.2	--
07-09	--	--	344	.47	79.9	185	9	.9	489	8.0	--
10-13	--	--	464	.63	212	191	0	2.4	692	8.0	--
14-22	--	--	265	.36	63.7	121	0	1.2	390	7.6	--
23-31	--	--	237	.32	72.9	112	0	1.2	351	7.4	--
APR.											
01-30	--	--	344	.47	25.1	181	0	1.5	541	7.6	--
MAY											
01-18	--	--	533	.72	48.1	286	0	1.9	802	7.9	--
19...	.37	.17	544	.74	89.1	294	0	2.0	839	8.0	33
20-25	--	--	619	.84	62.2	313	0	2.1	916	8.1	--
26-31	--	--	687	.93	22.3	326	0	2.7	1020	8.1	--
JUNE											
01-08	--	--	687	.93	22.3	326	0	2.7	1020	8.1	--
09-18	--	--	673	.92	36.3	323	0	2.6	1010	8.0	--
19-30	--	--	573	.78	15.2	288	0	2.4	885	8.1	--
JULY											
01-14	--	.14	565	.77	11.7	256	0	2.6	852	8.1	24
15-28	--	--	492	.67	5.84	229	0	2.4	763	7.8	--
29-31	--	--	407	.55	2.64	212	0	1.9	647	7.6	--
AUG.											
01-18	--	--	407	.55	2.64	212	0	1.9	647	7.6	--
19-31	--	--	409	.56	13.3	195	0	2.2	651	7.8	--
SEPT.											
01-10	--	--	409	.56	13.3	195	0	2.2	651	7.8	--
11-15	--	--	404	.55	6.11	187	0	2.3	647	7.9	--
16-24	--	.06	387	.53	18.8	180	0	2.0	613	7.9	--
25-30	--	--	392	.52	6.29	209	0	1.8	613	7.9	--
WTD. AVG. TIME	--	--	405	--	--	198	0	--	612	7.8	--
WTD. AVG. TONS PER DAY	--	--	460	.63	18.4	234	0	1.9	703	7.9	--

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	--	--	804	--	742	--	386	722	1050	740	641	--
2.....	504	--	--	--	778	632	384	725	1050	860	645	699
3.....	--	--	773	--	--	--	--	--	1020	837	--	684
4.....	493	823	771	461	--	862	403	742	--	869	--	699
5.....	--	--	775	598	785	888	--	--	--	--	748	699
6.....	491	753	788	588	757	888	419	746	1050	847	--	701
7.....	494	765	--	--	750	686	--	749	1030	860	695	--
8.....	495	--	778	--	--	438	441	783	1040	841	704	704
9.....	508	913	--	446	694	419	454	783	1040	864	635	686
10.....	507	910	871	460	783	--	454	807	1040	--	641	--
11.....	515	--	869	--	--	856	466	--	1040	824	--	--
12.....	472	983	873	527	757	544	--	--	1020	--	629	--
13.....	490	983	804	--	720	--	501	809	1020	803	595	--
14.....	467	1080	778	--	693	379	--	802	1020	805	--	653
15.....	469	940	756	566	718	387	525	792	972	788	562	653
16.....	469	964	723	573	832	397	525	811	964	793	663	641
17.....	557	--	806	537	--	--	525	854	--	786	578	611
18.....	557	779	806	590	--	--	--	852	941	744	590	612
19.....	555	779	754	--	757	--	--	861	941	761	567	--
20.....	549	768	878	647	771	389	627	854	888	--	578	625
21.....	571	1000	831	--	767	403	--	878	--	--	582	597
22.....	--	--	586	--	765	410	627	924	900	744	--	623
23.....	--	--	568	573	700	--	627	949	--	712	563	625
24.....	558	--	688	--	--	--	627	960	885	716	--	628
25.....	--	--	704	--	--	357	638	--	900	722	572	653
26.....	616	994	616	--	--	--	--	--	858	710	573	661
27.....	618	885	591	--	630	--	669	1010	890	728	591	668
28.....	624	791	604	572	613	322	--	1000	755	--	592	660
29.....	630	791	573	667	--	346	703	--	848	677	642	641
30.....	621	784	--	549	--	361	712	978	--	642	648	527
31.....	--	--	--	590	--	--	--	1040	--	639	--	--
AVERAGE	534	--	748	--	--	--	--	851	966	773	--	--

005056000 SHEYENNE RIVER NEAR WARWICK, N. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	2.5	---	2.0	---	2.0	17.0	18.5	14.0	22.5	---
2	15.0	---	---	---	2.5	3.5	0.5	19.5	20.0	18.5	23.5	18.5
3	---	---	2.5	---	---	---	---	---	23.5	20.0	---	16.5
4	12.5	1.5	2.0	1.0	---	2.0	1.5	15.5	---	20.5	---	15.5
5	---	---	3.5	1.0	1.5	4.0	---	---	---	---	25.5	15.0
6	10.0	4.5	2.5	1.0	2.0	3.5	2.5	10.0	17.5	24.0	---	15.5
7	5.0	5.0	---	---	1.5	2.5	---	13.5	16.5	27.0	21.0	---
8	11.0	---	2.0	---	---	1.5	2.5	11.5	17.0	22.0	22.0	15.5
9	7.5	5.0	---	1.5	1.0	2.0	4.0	12.0	17.5	24.5	19.5	19.0
10	7.0	5.5	2.0	1.5	1.5	---	5.5	11.0	17.0	---	20.0	---
11	7.5	---	2.5	1.5	---	1.0	7.5	---	16.0	22.5	---	---
12	9.0	4.0	2.0	1.0	1.0	2.0	---	---	19.5	---	20.0	---
13	9.5	3.5	1.5	---	1.0	---	5.5	15.0	17.5	24.5	17.5	---
14	13.0	1.5	2.0	---	1.5	2.0	---	17.5	17.0	25.5	---	22.0
15	9.0	2.0	3.5	2.0	1.5	2.0	9.0	14.5	18.5	24.5	20.0	23.5
16	8.5	4.5	2.5	4.5	1.0	1.5	10.0	13.5	19.0	22.5	15.5	18.5
17	7.5	---	2.0	3.5	---	---	9.5	10.0	---	24.0	16.0	17.0
18	7.0	2.5	2.0	2.5	---	---	---	7.5	19.0	23.5	19.5	16.0
19	6.0	2.0	1.5	---	1.5	---	---	8.5	24.0	25.5	18.5	---
20	6.0	2.5	1.5	1.5	0.5	0.5	8.5	11.5	23.5	---	18.5	16.5
21	6.0	1.5	1.0	---	1.0	0.5	---	15.5	---	---	19.0	15.0
22	---	---	1.5	---	2.0	0.5	9.0	14.5	20.0	23.5	---	16.0
23	---	---	1.5	1.5	1.5	---	8.5	15.0	---	24.0	17.5	18.5
24	5.5	---	---	2.0	---	---	8.5	16.0	17.5	22.5	---	11.5
25	---	---	---	2.0	---	1.5	10.0	---	17.5	22.0	20.0	11.5
26	5.5	0.5	3.5	---	---	---	---	---	20.0	21.5	18.5	12.0
27	5.0	0.5	1.5	---	3.5	---	11.5	15.5	20.5	21.0	20.5	12.5
28	5.0	2.0	2.0	2.0	1.5	1.5	---	15.5	19.5	---	22.5	12.5
29	4.5	1.5	1.5	2.0	---	1.5	17.0	---	18.5	22.0	19.5	14.5
30	4.5	3.5	---	2.0	---	1.5	16.5	17.5	---	21.0	19.5	15.0
31	---	---	---	2.0	---	---	---	17.0	---	21.5	---	---
AVERAGE	---	---	---	---	---	---	---	---	19.0	22.5	---	---

05056400 BIG COULEE NEAR CHURCHES FERRY, N. DAK.

LOCATION.--Lat 48°10'40", long 99°13'15", in NW¼ sec.12, T.154 N., R.67 W., Benson County, at gaging station at bridge on U.S. Highway 281, 1 mile downstream from Little Coulee, and 6 miles south of Churches Ferry.

DRAINAGE AREA.--2,510 sq mi, approximately, of which about 690 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: June 1954 to September 1968.

REMARKS.--No flow Nov. 24 to Mar. 6, June 1-7, June 14 to Sept. 30.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SI02)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)
OCT. 25...	.59	6.8	--	65	64	100	30	374	302	40	.3
NOV. 21...	1.0	4.5	--	70	66	88	34	416	264	39	.2
MAR. 08...	12	8.7	--	29	11	15	9.6	69	90	5.0	.1
14...	.15	23	--	105	47	65	25	353	274	27	.3
APR. 02...	.38	11	--	74	38	61	20	286	213	21	.2
MAY 01...	1.3	5.8	--	115	82	138	31	395	565	53	.2
16...A	2.8	16	1.1	133	78	136	26	348	592	51	.2
28...	.08	13	--	173	111	221	25	572	755	82	.3
DATE	NITRATE (NO3)	ORTHO PHOS-PHATE (PO4)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C)	DIS-SOLVED SOLIDS (PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARD-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHDS)	PH	COLOR
OCT. 25...	5.5	--	831	1.13	1.32	425	118	2.1	1190	8.2	23
NOV. 21...	.9	--	811	1.10	2.34	446	105	1.8	1180	7.8	22
MAR. 08...	.6	--	220	.30	7.37	118	61	.6	333	7.1	75
14...	14	--	788	1.07	.32	455	165	1.3	1100	7.9	33
APR. 02...	5.2	--	615	.84	.63	342	107	1.4	887	7.6	14
MAY 01...	1.2	--	1220	1.66	4.58	624	300	2.4	1640	7.9	25
16...	1.7	1.3	1290	1.75	9.75	651	365	2.3	1650	7.7	25
28...	2.5	--	1760	2.39	.38	887	418	3.2	2280	7.5	20

A INCLUDES 0.05 MG/L IRON (FE).

RED RIVER OF THE NORTH BASIN

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, N. DAK.

LOCATION.--Lat 47°26'01", long 98°01'43", in NE[]SE[] sec.27, T.146 N., R.58, W., Griggs County at gaging station at county bridge, 5 miles east of Cooperstown.

DRAINAGE AREA.--4,470 sq mi, approximately, of which 5,200 sq mi is probably noncontributing (includes about 3,800 sq mi in closed basins).

PERIOD OF RECORD.--Chemical analyses: October 1959 to September 1960, October 1966 to September 1968.
Water temperatures: October 1966 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 800 mg/l Jan. 29; minimum, 250 mg/l Mar. 27 to Apr. 4.
Hardness: Maximum, 408 mg/l Jan. 1-28; minimum, 126 mg/l Mar. 27 to Apr. 4.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SI02)	IRON (FE)	CALCIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HC03)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)
OCT.												
01-26	13	26	--	78	30	88	8.7	372	0	176	17	.3
27--A	13	20	.06	83	33	90	10	383	0	198	19	.1
28-31	15	18	--	73	34	100	7.7	401	0	194	20	.3
NOV.												
01-27	15	18	--	73	34	100	7.7	401	0	194	20	.3
28-30	10	18	--	88	40	107	8.2	450	15	190	20	.3
DEC.												
01-31	10	18	--	88	40	107	8.2	450	15	190	20	.3
JAN.												
01-28	8.8	25	--	96	41	96	7.4	486	0	183	18	.3
29--B	8.0	27	.06	95	38	94	7.0	480	0	164	20	.2
30-31	7.6	27	--	91	38	94	7.0	480	0	177	20	.2
FEB.												
01-29	7.6	27	--	91	38	94	7.0	480	0	177	20	.2
MAR.												
01-03	8.7	31	--	73	38	92	7.4	405	16	172	20	.1
04-08	48	14	--	33	14	25	9.8	143	0	71	7.4	.3
09-25	170	15	--	37	16	34	9.2	173	0	84	8.3	.2
26--C	250	14	.11	34	14	31	8.5	161	0	78	6.2	.2
27-31	336	13	--	30	12	27	6.9	145	0	64	5.4	.1
APR.												
01-04	336	13	--	30	12	27	6.9	145	0	64	5.4	.1
05-13	118	15	--	44	18	39	7.8	202	0	95	7.0	.1
14-22	75	12	--	55	23	53	7.4	249	4	123	10	.2
23-30	93	14	--	67	31	66	7.4	300	0	172	13	.2
MAY												
01-06	93	14	--	67	31	66	7.4	300	0	172	13	.2
07-19	80	18	--	80	34	73	2.8	351	0	179	14	.3
20--D	81	16	.03	75	33	67	2.3	358	0	155	14	.3
21-31	78	15	--	78	34	72	2.9	370	0	161	16	.3
JUNE												
01-06	51	19	--	71	34	78	9.0	384	0	159	16	.2
07-12	176	21	--	65	29	78	8.4	269	0	219	11	.3
13-22	76	23	--	79	37	91	8.4	374	0	209	15	.4
23-30	40	22	--	75	35	84	8.4	368	0	198	12	.4
JULY												
01-31	24	26	--	71	33	84	8.6	376	0	177	14	.3
AUG.												
01-08	14	23	--	64	30	79	7.6	369	0	139	15	.3
09-22	8.4	22	--	60	29	77	7.6	356	0	140	15	.2
23-31	24	18	--	55	27	73	8.0	325	0	133	13	.4
SEPT.												
01-30	25	19	--	58	25	60	7.4	303	0	116	14	.2
TIME	--	--	--	56	25	58	7.4	268	0	132	11	.2
WTD. AVG.	47.8	21	--	71	31	79	7.6	362	2	161	15	.3
TONS PER DAY	--	2.2	--	7.2	3.2	7.4	1.0	35	0	17	1.4	.0
A INCLUDES 0.23 MG/L MANGANESE (MN).												
B INCLUDES 2.70 MG/L MANGANESE (MN).												
C INCLUDES 0.15 MG/L MANGANESE (MN).												
D INCLUDES 0.24 MG/L MANGANESE (MN).												

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	UCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.5	1.5	0.5	0	0	0	0	15.5	16.5	14.5	16.0	---
2	13.5	1.5	0.5	0	0	0	0	15.5	18.5	16.5	18.5	---
3	15.0	1.5	0.5	0	0	0.5	1.0	12.0	19.0	18.5	24.5	16.0
4	11.5	1.0	1.0	0	0	0.5	1.0	---	20.5	---	24.5	16.0
5	10.0	1.0	1.0	0	0	0.5	---	10.0	20.0	20.0	26.5	---
6	---	1.0	1.0	0	0	0.5	---	10.0	18.5	25.5	26.5	14.5
7	6.5	0.5	1.0	0	0	0.5	1.0	10.0	16.5	25.5	24.5	16.5
8	6.5	---	1.0	0	0	0.5	---	9.0	16.5	22.0	23.5	15.5
9	7.5	2.0	0.5	0	0	0.5	1.0	19.0	---	23.5	21.0	15.5
10	---	3.5	0.5	0	0	0.5	1.5	12.0	16.5	24.5	20.5	15.5
11	8.5	2.0	0.5	0	0	0	3.5	9.5	---	25.5	20.5	16.0
12	7.5	1.0	0.5	0	0	0	3.5	---	16.5	25.5	21.0	16.0
13	---	1.0	0.5	0	0	0	5.5	---	17.5	24.5	19.0	---
14	7.5	1.0	0.5	0	0	0	4.5	17.5	15.5	24.5	---	18.5
15	6.5	1.5	0.5	0	0	0	2.5	14.5	16.5	25.5	17.0	14.0
16	7.5	---	0.5	0.5	0	1.0	4.5	14.0	17.0	22.5	17.0	---
17	6.5	---	0.5	0.5	0	1.0	3.5	9.5	---	24.0	16.5	---
18	6.5	1.0	0.5	0.5	0	---	3.5	5.0	19.0	25.0	---	---
19	7.0	1.0	0.5	0.5	0	---	---	9.0	21.0	24.5	19.0	15.5
20	6.5	0.5	0	0	0	---	---	10.0	19.5	26.0	21.0	15.5
21	6.5	0.5	---	0	0	0.5	5.5	14.0	---	22.0	21.0	14.5
22	6.5	0.5	---	0	0	0.5	13.5	---	20.0	---	20.5	---
23	6.5	---	0.5	0	---	0.5	4.5	16.5	20.5	25.0	20.5	13.5
24	4.0	0.5	0.5	0	---	0.5	5.5	16.0	18.5	23.5	19.0	12.0
25	3.5	0.5	0	0	0	1.0	7.0	15.0	17.0	---	20.5	11.5
26	---	0.5	0	0	0	1.5	10.0	15.0	19.0	---	17.5	12.0
27	1.5	0.5	0	0	0	0.5	11.5	---	19.0	---	19.5	12.0
28	0	0.5	0	0	0	0.5	10.0	---	20.0	---	21.0	12.0
29	0	0.5	---	0	0	0.5	9.0	15.5	19.0	---	19.5	12.0
30	2.0	0.5	0	0	---	0.5	14.5	16.0	17.5	20.5	19.0	---
31	2.0	---	0	---	---	1.0	---	16.0	---	20.5	---	---
AVERAGE	6.5	1.0	---	---	0	0.5	5.0	12.5	18.5	23.0	20.5	---

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

EXTREMES, 1967-68.--Continued:

Specific conductance: Maximum daily, 1,190 micromhos Dec. 3-5; minimum daily, 326 micromhos Mar. 8.
 Water temperatures: Maximum, 27.0°C Aug. 5, 6; minimum, freezing point on many days during October, December to April.

Period of record:

Dissolved solids: Maximum, 1,230 mg/l Mar. 15-18, 1967; minimum, 208 mg/l Mar. 24-25, 1967.
 Hardness: Maximum, 661 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, 310 micromhos Mar. 25, 1967.
 Water temperature: Maximum 27.0°C Aug. 5, 6, 1968; minimum, freezing point on many days during winter periods.

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	NITRATE (NO3)	ORTHO-PHOSPHATE (PO4)	BORON (B)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ALUMINUM CONDUCTANCE (MICROMHOS)	PH	COLOR	
OCT.												
01-26	.2	--	.20	621	.86	21	317	12	2.2	928	8.0	--
27...	.1	.35	.18	651	.89	22	343	29	2.1	971	7.8	--
28-31	.2	--	.22	653	.89	26	320	0	2.4	971	8.2	45
NOV.												
01-27	.2	--	.22	653	.89	26	320	0	2.4	971	8.2	45
28-30	.4	--	.23	713	.97	19	382	0	2.4	1070	8.5	13
DEC.												
01-31	.4	--	.23	713	.97	19	382	0	2.4	1070	8.5	13
JAN.												
01-28	2.2	--	.20	726	.99	17	408	9	2.1	1040	8.0	--
29...	2.1	--	.18	800	1.09	17	391	0	2.1	1020	8.2	--
30-31	.5	--	.18	702	.95	14	383	0	2.1	1040	8.1	--
FEB.												
01-29	.5	--	.18	702	.95	14	383	0	2.1	1040	8.1	--
MAR.												
01-03	.2	--	.20	688	.94	16	337	0	2.2	983	8.4	--
04-08	2.9	--	.12	265	.36	34	137	20	.9	393	7.9	--
09-25	2.7	--	.10	308	.42	141	157	15	1.2	483	7.8	--
26...	2.2	.76	.08	281	.38	190	142	10	1.1	415	8.0	--
27-31	2.0	--	.07	250	.34	227	126	7	1.0	383	7.9	45
APR.												
01-04	2.0	--	.07	250	.34	227	126	7	1.0	383	7.9	45
05-13	1.5	--	.11	358	.49	114	184	18	1.3	532	8.1	25
14-22	.7	--	.13	438	.60	88	233	22	1.5	663	8.3	15
23-30	.3	--	.13	540	.73	136	294	48	1.7	811	7.8	18
MAY												
01-06	.3	--	.13	540	.73	136	294	48	1.7	811	7.8	--
07-19	.6	--	.16	596	.81	129	338	50	1.7	897	7.9	12
20...	.3	.56	.14	566	.77	124	321	27	1.6	852	7.9	18
21-31	.6	--	.16	581	.79	122	332	28	1.7	878	7.8	14
JUNE												
01-06	1.2	--	.22	596	.81	82	318	3	1.9	901	8.0	--
07-12	1.5	--	.18	584	.79	278	281	61	2.0	855	7.9	--
13-22	1.2	--	.21	698	.95	143	350	44	2.1	1010	7.9	22
23-30	2.2	--	.19	644	.88	69	331	30	2.0	942	7.8	16
JULY												
01-31	1.5	--	.26	622	.85	40	314	5	2.1	919	7.9	14
AUG.												
01-08	.4	--	.21	563	.77	22	284	0	2.0	833	8.1	22
09-22	.3	--	.22	554	.75	12	272	0	2.0	819	8.0	22
23-31	.2	--	.20	497	.68	32	250	0	2.0	775	8.0	16
SEPT.												
01-30	.4	--	.18	473	.64	31	247	0	1.7	715	7.6	--
WTD. AVG. TIME	1.4	--	.14	460	--	--	240	21	--	691	7.9	--
WTD. AVG. TONS PER DAY	.9	--	.19	585	.80	59	307	12	1.9	870	8.0	--

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	891	918	1140	--	1040	923	--	--	--	--	--	--
2.....	878	969	1160	1040	--	--	422	819	860	968	832	--
3.....	893	913	1190	991	1040	1040	361	819	904	946	826	686
4.....	903	991	1190	--	--	539	378	823	904	--	824	686
5.....	903	1020	1190	--	1040	449	--	--	897	912	830	--
6.....	--	1030	1180	1040	1050	397	--	832	880	948	828	727
7.....	927	--	1170	--	--	381	518	895	862	--	824	767
8.....	922	1010	1150	954	1040	326	517	883	713	887	818	820
9.....	956	994	1120	1110	1030	350	545	895	840	919	822	720
10.....	--	969	1030	1120	1020	562	555	924	840	935	822	680
11.....	945	943	1050	--	1030	418	575	908	--	943	642	680
12.....	940	966	1040	1120	959	415	562	--	974	912	822	706
13.....	--	942	1000	1070	1040	405	588	--	1000	894	822	722
14.....	905	903	--	--	951	381	606	908	1010	987	--	707
15.....	893	903	--	1070	1020	416	621	908	954	875	826	687
16.....	893	--	1030	1100	1040	448	628	916	982	868	836	--
17.....	889	--	--	1100	1050	449	637	885	1010	862	838	--
18.....	937	1030	1050	1100	1060	--	--	724	916	991	--	--
19.....	900	906	1070	1090	--	--	--	866	994	887	836	696
20.....	898	961	1080	1100	1020	--	--	866	974	887	720	792
21.....	942	918	--	1090	1060	576	--	878	--	885	834	694
22.....	882	1010	--	1090	1020	--	737	888	938	--	824	--
23.....	871	--	1030	1080	--	441	816	895	946	885	791	692
24.....	851	1010	1000	--	--	421	822	888	959	885	795	683
25.....	891	1010	1000	1040	1080	418	793	890	869	--	793	714
26.....	--	891	1000	1050	1040	411	793	866	864	--	744	700
27.....	964	--	--	1050	1100	392	785	--	907	855	840	692
28.....	988	--	1000	994	1090	379	808	--	959	875	771	690
29.....	994	1060	--	1060	1100	348	808	878	959	--	747	713
30.....	994	1080	1000	1050	--	335	791	880	951	857	671	--
31.....	983	--	977	--	--	352	--	898	--	853	--	--
AVERAGE	919	972	1080	--	--	460	641	876	923	898	800	--

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 downstream from dam at State fish hatchery at north edge of city of Lisbon, 3 miles upstream from Timber Coulee, and at mile 162.1.

DRAINAGE AREA.--8,190 sq mi, approximately, of which about 5,700 sq mi is probably noncontributing (includes 3,800 sq m. in closed basins).

PERIOD OF RECORD.--Chemical analyses: August 1956 to September 1968.
Water temperatures: August 1956 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 815 mg/l Mar. 1-3; minimum, 466 mg/l Mar. 28 to Apr. 4.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DATE	MEAN DIS-CHARGE (CFS)	SILICA (SiO ₂)	IRON (FE)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO ₃)	CAR-BONATE (CO ₃)	SULFATE (SO ₄)	CHLO-RIDE (CL)	FLUO-RIDE (F)
OCT.												
01-26	18	--	--	--	--	86	--	270	0	212	--	--
27...A	18	12	.09	73	34	82	12	219	0	209	41	.1
28-31	19	--	--	--	--	86	--	288	0	217	--	--
NOV.												
01-12	19	--	--	--	--	86	--	288	0	217	--	--
13-30	36	--	--	--	--	92	--	288	0	230	--	--
DEC.												
01-29	43	--	--	--	--	103	--	343	0	257	--	--
30...A	38	9.9	.04	69	39	98	12	311	12	240	35	.3
FEB.												
01-29	41	--	--	--	--	116	--	346	0	253	--	--
MAR.												
01-03	44	--	--	--	--	126	--	370	0	267	--	--
04-13	220	--	--	--	--	75	--	236	0	168	--	--
14-26	88	--	--	--	--	60	--	202	0	160	--	--
27...B	148	12	.05	58	26	66	10	217	0	171	27	.3
28-31	110	--	--	--	--	63	--	198	0	156	--	--
APR.												
01-04	110	--	--	--	--	63	--	198	0	156	--	--
05-15	307	--	--	--	--	81	--	267	0	198	--	--
16-30	82	--	--	--	--	90	--	276	0	227	--	--
MAY												
01-16	200	--	--	--	--	85	--	277	0	232	--	--
17...C	192	8.2	.03	70	38	92	11	279	0	267	31	.3
18-21	178	--	--	--	--	88	--	279	0	250	--	--
22-31	72	--	--	--	--	90	--	293	0	235	--	--
JUNE												
01-08	72	--	--	--	--	90	--	293	0	235	--	--
09-12	487	--	--	--	--	85	--	260	0	209	--	--
13-17	1110	--	--	--	--	81	--	253	0	178	--	--
18-19	403	--	--	--	--	72	--	249	0	178	--	--
20-30	89	--	--	--	--	80	--	277	0	199	--	--
JULY												
01-17	63	17	--	70	37	97	11	296	0	261	38	.3
18-31	29	--	--	--	--	92	--	292	0	240	--	--
AUG.												
01-31	18	--	--	--	--	105	--	300	0	270	--	--
SEPT.												
01-29	22	--	--	--	--	102	--	276	0	247	--	--
30...A	18	14	--	63	33	88	11	263	0	213	42	.3
TIME												
MTD. AVG.	D91	--	--	--	--	93	--	287	0	229	--	--

A INCLUDES 0.34 MG/L MANGANESE (MN).

B INCLUDES 0.24 MG/L MANGANESE (MN).

C INCLUDES 0.10 MG/L MANGANESE (MN).

D MEAN DISCHARGE FOR 334 DAYS OF CHEMICAL ANALYSES; MEAN DISCHARGE BASED ON 366 DAYS, 86.8 CFS.

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	936	950	1160	--	1080	1180	742	1050	855	966	1080	1060
2.....	931	947	1190	--	1080	1180	752	1070	895	974	1080	1060
3.....	931	952	1220	--	1070	1180	681	1070	988	952	1080	1060
4.....	939	966	1240	--	1070	1170	640	1040	1010	988	1080	1050
5.....	944	966	1260	--	1060	1000	691	978	1010	1010	1100	1060
6.....	947	980	1310	--	1060	665	800	961	1020	954	1050	1060
7.....	942	994	1140	--	1060	827	789	935	1010	882	1090	1060
8.....	947	991	1120	--	1070	758	934	901	1020	1020	1090	1060
9.....	944	991	1130	--	1070	753	931	893	955	1040	1110	1060
10.....	942	982	1160	--	1070	689	886	881	866	1040	1120	1060
11.....	939	966	1120	--	1070	704	881	891	941	1050	1120	1060
12.....	939	968	1100	--	1080	689	881	883	880	1040	1120	1060
13.....	934	977	1110	--	1090	709	895	903	826	1040	1120	1070
14.....	914	982	1100	--	1090	729	895	932	756	1040	1120	1070
15.....	919	982	1100	--	1090	736	898	946	809	1030	1110	1060
16.....	919	1000	1130	--	1100	709	905	961	734	941	1110	1070
17.....	926	982	1130	--	1110	712	905	1010	785	918	1100	1040
18.....	931	968	1120	--	1140	696	923	1010	758	926	1100	1040
19.....	934	958	1120	--	1140	679	921	1000	857	982	1090	1030
20.....	939	955	1100	--	1130	678	898	988	834	1000	1090	1020
21.....	939	971	1060	--	1140	672	918	978	850	1010	1080	1020
22.....	947	1000	1040	--	1160	680	923	970	861	1000	1080	1010
23.....	944	1010	1020	--	1170	720	953	961	868	1010	1070	1000
24.....	947	980	1040	--	1170	734	964	961	898	1020	1080	994
25.....	942	991	1060	--	1180	746	950	961	927	1010	1080	980
26.....	942	1040	1060	--	1180	778	967	964	927	1020	1090	952
27.....	942	1070	1040	--	1210	744	979	964	927	1020	1100	942
28.....	942	1130	1040	--	1200	739	973	970	930	1030	1100	942
29.....	936	1200	1040	--	1200	728	982	949	941	1040	1080	939
30.....	942	1200	1030	--	--	682	991	984	924	1050	1080	942
31.....	942	--	1040	--	--	728	--	975	--	1070	1060	--
AVERAGE	937	1000	1110	--	1120	786	881	965	899	1010	1090	1030

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

EXTREMES, 1967-68.--Continued:

Hardness: Maximum, 382 mg/l Dec. 1-29; minimum, 230 mg/l Mar. 28 to Apr. 4.

Specific conductance: Maximum daily, 1,310 micromhos Dec. 8; minimum daily, 640 micromhos Apr. 4.

Water temperatures: Maximum, 29.0°C July 15, 19; minimum, freezing point on many days during November to April.

Period of record:

Dissolved solids (1956-58, 1959-68): 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, 32.0°C Aug. 23, 1959; minimum, freezing point on many days during winter periods.

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	NITRATE (NO3)	ORTHOPHOS- PHATE (PO4)	BORON (B)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SODIUM AD- SORP- TION RATIO	SPECI- FIC CON- DUCTANCE (MICRO- MHOS)	PH	COLOR
OCT.												
01-26	--	--	--	621	.84	30	308	87	2.1	937	8.2	--
27...	.1	.22	.20	621	.84	30	321	92	2.0	944	7.7	--
28-31	--	--	--	643	.87	33	338	102	2.0	963	8.0	--
NOV.												
01-12	--	--	--	643	.87	33	338	102	2.0	963	8.0	--
13-30	--	--	--	682	.93	66	336	100	2.2	1010	8.2	--
DEC.												
01-29	--	--	--	754	1.02	87	382	101	2.3	1130	7.7	--
30...	.0	--	.20	700	.95	71	333	58	2.3	1040	8.4	--
FEB.												
01-29	--	--	--	763	1.04	84	360	76	2.7	1110	7.9	--
MAR.												
01-03	--	--	--	815	1.11	96	378	74	2.8	1190	8.0	--
04-13	--	--	--	524	.71	311	241	47	2.1	786	7.6	--
14-26	--	--	--	478	.65	114	235	69	1.7	720	7.4	--
27...	3.2	.85	.14	499	.68	199	248	70	1.8	761	7.4	18
28-31	--	--	--	466	.63	138	230	69	1.8	711	7.6	--
APR.												
01-04	--	--	--	466	.63	138	230	68	1.8	711	7.6	--
05-15	--	--	--	578	.79	479	284	65	2.1	866	7.7	--
16-30	--	--	--	624	.85	133	307	81	2.2	943	7.6	--
MAY												
01-16	--	--	--	641	.87	346	312	84	2.1	949	7.6	--
17...	.5	.26	.15	670	.91	347	331	102	2.2	1000	7.5	14
18-21	--	--	--	674	.92	324	338	109	2.1	997	7.9	--
22-31	--	--	--	644	.88	125	328	88	2.2	980	7.8	--
JUNE												
01-08	--	--	--	644	.88	125	328	88	2.2	980	7.8	--
09-12	--	--	--	602	.82	792	293	80	2.2	911	7.7	--
13-17	--	--	--	522	.71	1560	264	57	2.2	796	7.9	--
18-19	--	--	--	522	.71	568	263	58	1.9	792	8.1	--
20-30	--	--	--	597	.81	144	301	73	2.0	887	7.8	--
JULY												
01-17	.4	--	.22	691	.94	118	328	85	2.3	1020	7.8	15
18-31	--	--	--	682	.93	53	340	101	2.2	1010	7.8	--
AUG.												
01-31	--	--	--	742	1.01	36	367	120	2.4	1100	7.7	--
SEPT.												
01-29	--	--	--	674	.92	40	334	108	2.4	1040	7.8	--
30...	.0	--	.24	656	.89	31	291	75	2.2	942	7.7	--
TIME												
WTO. AVG.	--	--	--	659	.90	148	325	89	2.2	986	7.8	--

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	1.0	0	0	0	0	0	10.5	18.5	17.0	21.0	---
2	14.0	2.5	0.5	0	0	0	0	10.0	17.5	17.5	27.0	---
3	13.5	0.5	0.5	0	0	0	0	10.0	24.5	21.0	24.0	---
4	13.5	1.5	0.5	0	0	0	0	10.0	23.5	21.5	24.0	---
5	13.5	1.5	0.5	0	0	0	0	0.5	9.5	21.0	25.0	---
6	12.5	1.5	0.5	0	0	0	1.5	9.0	23.5	22.5	27.5	---
7	12.0	1.5	0	0	0	0	2.0	8.5	21.0	27.5	25.0	---
8	10.5	2.5	0	0	0	0.5	3.5	7.5	22.0	22.5	25.5	---
9	10.0	2.5	0	0	0	0	4.5	8.5	21.0	24.0	21.0	---
10	9.0	2.5	0	0	0	0	7.5	8.5	20.5	26.0	22.5	---
11	8.5	3.5	0	0	0	0	6.5	7.5	19.5	25.5	22.5	---
12	8.5	3.5	0	0	0	0	8.5	8.5	19.5	27.5	23.5	---
13	9.0	3.5	0	0	0	0	6.5	9.0	19.5	27.5	21.0	19.5
14	11.0	2.5	0	0	0	0	6.0	9.5	17.0	25.5	21.0	19.5
15	10.0	1.5	0	0	0	0	5.0	9.0	17.0	29.0	---	19.5
16	9.0	1.5	0.5	0	0	0.5	6.0	9.5	17.0	25.5	---	19.0
17	8.5	1.5	0.5	0	0	0	5.5	9.5	17.0	27.5	---	17.5
18	8.5	1.0	0	0	0	0	7.5	9.0	19.5	27.5	---	17.0
19	7.0	1.5	0	0	0	0	8.5	9.0	21.0	29.0	---	17.5
20	6.5	1.0	0	0	0	0	6.5	11.0	21.5	27.5	---	17.0
21	6.5	1.5	0	0	0	0	7.5	12.5	24.5	25.0	---	16.5
22	8.5	1.5	0	0	0	0	7.5	13.5	21.5	25.5	---	18.5
23	7.0	1.5	0	0	0	0	8.5	15.0	22.0	25.0	---	18.5
24	7.0	1.5	0	0	0	0	5.0	14.5	20.0	25.0	---	15.5
25	5.5	1.0	0	0	0	0	7.5	15.5	19.0	25.5	---	14.5
26	5.0	1.0	0	0	0	0	9.0	15.5	20.0	25.5	---	14.5
27	4.5	1.0	0	0	0	0	6.5	12.5	21.0	24.5	---	14.5
28	4.0	0.5	0	0	0	0	7.5	15.5	22.0	23.5	---	14.0
29	2.5	0	0	0	0	0	8.5	20.0	20.0	24.5	---	15.5
30	2.0	0	0	0	---	0	9.5	17.5	19.5	23.5	---	16.5
31	0.5	---	0	0	---	0	---	19.0	---	22.0	---	---
AVERAGE	6.5	1.5	0	0	0	0	5.0	11.5	20.5	24.5	---	---

RED RIVER OF THE NORTH BASIN

05064900 BEAVER CREEK NEAR FIMLEY, N. DAK.
(Hydrologic bench-mark station)LOCATION.--Lat 47°36', long 97°43', in NE $\frac{1}{4}$ sec.31, T.148 N., R.55 W., Steele County, at gaging station 500 ft upstream from bridge on county road and 7 miles northeast of Finley.

DRAINAGE AREA.--160 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1968.

REMARKS.--No flow Oct. 1 to Mar. 4.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SI O ₂)	MANGANESE (MN)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (MC O ₃)	SULFATE (SO ₄)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO ₃)
MAR. 26...	17	13	.15	53	19	28	7.4	140	152	8.0	.2	2.4
APR. 10...	1.7	15	.06	100	39	68	8.9	239	317	20	.2	.3
MAY 20...	.91	9.2	.00	150	65	116	11	342	525	40	.2	.5
JUNE 28...	.91	12	--	128	51	108	9.3	349	414	26	.3	.3
JULY 24...	24	20	.03	128	59	130	12	391	445	29	.3	.4
AUG. 28...	.10	12	.00	74	36	78	9.7	272	230	27	.3	.3
SEPT. 25...	.33	17	.04	88	40	80	11	344	244	24	.3	.2

DATE	ORTHO PHOSPHATE (PO ₄)	TOTAL CHROMIUM (CR)	DISSOLVED SOLIDS (RESIDUE AT 180 C)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM AD-SORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHMS)	PH	COLOR
MAR. 26...	.80	--	367	.50	16.8	210	95	.8	548	7.7	30
APR. 10...	.03	.00	725	.99	3.33	409	213	1.5	1010	7.2	24
MAY 20...	.34	--	1180	1.60	2.90	642	361	2.0	1530	7.7	22
JUNE 28...	.15	--	960	1.31	2.36	526	240	2.0	1310	7.7	27
JULY 24...	.12	--	1070	1.46	70.8	559	238	2.4	1450	8.0	30
AUG. 28...	.30	.00	669	.83	.16	334	111	1.9	934	7.8	12
SEPT. 25...	.21	--	695	.95	.62	383	101	1.8	1020	7.8	30

ADDITIONAL DETERMINATIONS IN MILLIGRAMS PER LITER

DATE	IRON (FE)	NICKEL (NI)	COPPER (CU)	LEAD (PB)	ZINC (ZN)	COBALT (CO)	CADMIUM (CD)	STRONTIUM (SR)	LITHIUM (LI)	METHYLENE BLUE ACTIVE SUBSTANCE	BIOCHEMICAL OXYGEN DEMAND	DISSOLVED OXYGEN	CULIFORM (COLONIES PER 100 ML)
MAR. 26...	.08	--	--	--	--	--	--	--	--	--	1.3	--	--
APR. 10...	.05	.00	.00	.00	.00	.00	.00	.43	.00	--	2.4	3.7	--
MAY 20...	.03	--	--	--	--	--	--	--	--	.10	1.2	3.2	94
JUNE 28...	--	--	--	--	--	--	--	.60	.00	--	8.3	7.1	188
JULY 24...	.04	--	--	--	--	--	--	--	--	--	2.7	7.2	67
AUG. 28...	.01	.00	.00	.00	.00	.00	.00	.24	.07	--	6.7	3.0	0
SEPT. 25...	.01	--	--	--	--	--	--	--	--	--	1.6	--	8

PESTICIDE ANALYSES
(µg/l)

Date of collection	Time	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor Epoxide	Lindane	2,4-D	Silvex	2,4,5-T
Mar. 26, 1968	1115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May 20.....	1100	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	0.00	0.00

RADIOCHEMICAL DATA

Date of collection	Time	Dissolved				Suspended		Suspended sediments (mg/l)
		Uranium (µg/l)	Radium (pc/l)	Gross (µg U/l)	Gross (pc/l)	Gross (µg U/l)	Gross (pc/l)	
Mar. 26, 1968	1115	2.9	0.1	12	13	0.5	3.4	11
July 24.....	1100	6.5	<.1	16	24	.7	4.1	18

INSTANTANEOUS SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
MAR 26, 1968	1115	17	22	1.0	JUL 24.....	1000	24	36	2.3
MAY 20.....	0945	.91	56	.14					

RED RIVER OF THE NORTH BASIN

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

LOCATION.--Lat 47°56'26", long 97°02'40", in SW¼ sec.33, T.152 N., R.50 W., Grand Forks County, at dam at River-side Park in Grand Forks, 1,500 ft upstream from gaging station, 2 miles downstream from Red Lake River, and at mile 296.0.

DRAINAGE AREA.--30,100 sq mi, approximately (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--Chemical analyses: September 1956 to September 1968.
Water temperatures: October 1956 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 471 mg/l May 20-31; minimum, 259 mg/l July 18-25.
Hardness: Maximum, 328 mg/l May 20-31; minimum, 195 mg/l July 18-25.
Specific conductance: Maximum daily, 649 micromhos Mar. 16; minimum daily, 358 micromhos July 19.
Water temperatures: Maximum, 24.5°C July 16; minimum, 1.5°C on many days during December to April.

Period of record:

Dissolved solids (1956-58, 1959-68): 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, 28.0°C July 19, 1964; minimum, freezing point on many days in 1967.

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SIQ2)	CALCIUM (CA)	MAGNE- SIUM (MG)	SODIUM (NA)	POTAS- SIUM (K)	BICAR- BONATE (MCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	MILLI- GRAMS (F)	NITRATE (NO3)
OCT.												
01-26	782	--	--	--	19	--	261	0	45	--	--	--
27...A	745	13	51	24	15	3.0	252	0	40	8.6	.2	.3
28-31	707	--	--	--	18	--	269	0	43	--	--	--
NOV.												
01-30	707	--	--	--	18	--	269	0	43	--	--	--
DEC.												
01-31	718	--	--	--	28	--	320	0	75	--	--	--
JAN.												
01-31	592	--	--	--	28	--	332	0	65	--	--	--
FEB.												
01-29	540	--	--	--	25	--	333	0	60	--	--	--
MAR.												
01-18	754	--	--	--	31	--	318	0	77	--	--	--
19-21	1650	--	--	--	30	--	264	0	93	--	--	--
22-24	2630	--	--	--	22	--	219	0	74	--	--	--
25...B	2600	12	47	21	19	7.1	188	0	74	9.0	+2	3.0
26-31	2930	--	--	--	19	--	200	0	84	--	--	--
APR.												
01-30	2930	--	--	--	19	--	200	0	84	--	--	--
MAY												
01-18	1930	--	--	--	27	--	276	0	124	--	--	--
19...C	2200	7.7	70	35	31	1.8	280	0	131	13	.3	.3
20-31	1780	--	--	--	31	--	290	0	135	--	--	--
JUNE												
01-06	1370	--	--	--	30	--	288	0	126	--	--	--
07-08	4420	--	--	--	23	--	276	0	104	--	--	--
09-13	8240	--	--	--	10	--	184	0	64	--	--	--
14-20	5720	--	--	--	18	--	220	0	115	--	--	--
21-30	3900	--	--	--	26	--	245	0	124	--	--	--
JULY												
01-17	2930	--	--	--	17	--	250	0	91	--	--	--
18-25	7200	--	--	--	6.2	--	176	0	58	--	--	--
26-31	3760	--	--	--	8.7	--	210	0	74	--	--	--
AUG.												
01-31	2160	--	--	--	11	--	221	0	68	--	--	--
SEPT.												
01...D	1780	8.5	58	21	10	4.3	225	0	62	11	.3	1.0
02-30	1540	--	--	--	10	--	221	0	61	--	--	--
WTD. AVG.	--	--	--	--	18	--	235	0	82	--	--	--
TIME												
WTD. AVG.	1840	--	--	--	21	--	263	0	75	--	--	--
TONS												
PER DAY	--	--	--	--	89	--	1170	0	409	--	--	--
A INCLUDES 0.10 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).												
B INCLUDES 0.02 MG/L IRON (FE) AND 0.03 MG/L MANGANESE (MN).												
C INCLUDES 0.04 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).												
D INCLUDES 0.03 MG/L IRON (FE).												

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	409	511	567	654	620	670	385	664	724	609	490	420
2.....	440	494	565	647	620	663	412	664	716	600	490	455
3.....	454	490	568	652	622	663	416	649	711	574	488	444
4.....	464	486	599	661	615	658	453	649	766	522	487	438
5.....	459	499	624	657	618	659	493	652	702	542	496	434
6.....	456	485	613	661	622	658	472	667	641	556	493	435
7.....	459	505	616	657	624	661	472	619	665	556	493	446
8.....	459	523	673	670	624	650	497	649	616	556	486	445
9.....	462	507	684	678	636	648	502	620	582	545	490	441
10.....	453	535	667	679	636	646	505	686	381	552	468	464
11.....	456	497	696	675	637	623	520	700	422	554	462	441
12.....	465	474	737	665	632	611	557	706	448	557	462	464
13.....	480	471	706	674	636	609	549	695	475	594	463	478
14.....	511	479	715	667	609	593	692	647	455	547	459	470
15.....	483	502	715	660	633	670	565	690	583	539	465	467
16.....	456	516	708	672	627	849	559	688	579	530	470	451
17.....	465	538	703	662	627	743	553	676	594	482	473	470
18.....	478	516	667	665	637	674	588	700	589	416	462	461
19.....	484	505	659	656	633	635	586	695	608	358	458	462
20.....	472	492	652	643	631	630	597	692	599	364	455	458
21.....	477	492	659	633	642	629	611	704	666	365	455	455
22.....	464	531	656	634	644	581	618	698	637	379	437	510
23.....	470	528	660	634	643	516	606	714	658	401	430	484
24.....	476	550	660	629	651	464	609	720	650	422	427	510
25.....	478	520	664	623	655	469	616	720	656	434	427	531
26.....	477	535	662	614	648	473	627	719	649	441	431	515
27.....	464	555	664	614	655	461	625	720	652	453	439	513
28.....	470	580	669	606	653	447	632	712	644	464	444	496
29.....	471	538	680	605	659	403	642	708	634	464	456	500
30.....	477	569	668	609	--	392	650	706	606	477	463	500
31.....	489	--	650	636	--	380	--	714	--	482	466	--
AVERAGE	467	514	658	648	635	594	647	692	600	493	464	468

RED RIVER OF THE NORTH BASIN

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	CRTHD PHOS- PHATE (PO4)	BORON (B)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SODIUM AD- SORP- TION RATIO	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	CLLCL
OCT.											
01-26	---	---	296	.40	625	220	22	.6	472	7.8	---
27-...	.48	.07	288	.39	582	224	17	.6	478	7.6	---
28-31	---	---	321	.44	613	238	18	.5	518	8.0	---
NOV.											
01-30	---	---	321	.44	613	238	18	.5	518	8.0	---
DEC.											
01-31	---	---	429	.58	832	315	53	.7	669	8.0	---
JAN.											
01-31	---	---	414	.56	662	302	30	.7	648	7.8	---
FEB.											
01-29	---	---	403	.55	588	302	29	.6	634	8.0	---
MAR.											
01-18	---	---	440	.60	896	305	44	.8	672	7.9	---
19-21	---	---	432	.59	1930	268	52	.8	647	7.8	---
22-24	---	---	337	.46	2390	225	45	.6	515	7.6	---
25-...	.74	.07	301	.41	2110	203	49	.6	469	7.9	27
26-31	---	---	327	.44	2590	227	63	.5	504	7.4	---
APR.											
01-30	---	---	327	.44	2590	227	63	.5	504	7.4	---
MAY											
01-18	---	---	449	.61	2340	318	92	.7	683	8.0	---
19-...	.49	.10	461	.63	2740	317	87	.8	702	7.7	22
20-31	---	---	471	.64	2260	328	91	.7	713	8.0	---
JUNE											
01-06	---	---	450	.61	1670	322	86	.7	699	7.9	---
07-08	---	---	418	.57	4090	300	74	.6	635	8.0	---
09-13	---	---	274	.37	6110	202	51	.3	424	7.7	---
14-20	---	---	395	.54	6100	279	99	.5	576	7.4	---
21-30	---	---	436	.59	4590	299	98	.7	640	7.6	---
JULY											
01-17	---	---	367	.50	2900	289	64	.5	552	7.6	---
18-25	---	---	299	.35	5040	195	51	.2	391	7.7	---
26-31	---	---	314	.43	3190	233	61	.2	459	7.7	---
AUG.											
01-31	---	---	317	.43	1850	235	53	.3	474	7.5	---
SEPT.											
01-...	---	.16	372	.51	1790	231	47	.3	477	7.2	---
02-30	---	---	305	.41	1270	240	59	.3	476	7.5	---
MTD. AVG.	---	---	352	---	---	254	61	---	536	7.7	---
TIME											
MTD. AVG.	---	---	367	.50	1750	267	51	.5	567	7.8	---
TONS PER DAY	---	---	---	---	---	---	---	---	---	---	---

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

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

05092000 RED RIVER OF THE NORTH AT DRAYTON, N. DAK.

LOCATION.--Lat 48°34'20", long 97°08'50", on line between secs.24 and 25, T.159 N., R.51 W., Pembina County, temperature recorder at gaging station at interstate highway bridge, 1.5 miles northeast of Drayton and at mile 207.

DRAINAGE AREA.--34,800 sq mi, approximately (includes 3,800 in closed basins).

PERIOD OF RECORD.--Chemical analyses: June 1954 to September 1955.

Water temperatures: December 1956 to September 1961, October 1965 to September 1966, October 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 24.0°C on several days during July; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum (1956-58, 1959-61, 1965-66, 1967-68), 28.0°C July 20-23, 1960; minimum, freezing point on many days during winter periods most years.

REMARKS.--No Record Oct. 1-15, Dec. 14 to Jan. 9, Mar. 11 to May 15 due to malfunctions of instrument. Recorder stopped Sept. 11-17. Estimated temperature, freezing point Dec. 14 to Jan. 9, Mar. 11-24.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1961 TO SEPTEMBER 1968 (CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

Table with columns for MONTH, DAY (1-31), and AVERAGE. Rows list months from OCTOBER to SEPTEMBER, with MAXIMUM and MINIMUM values for each day.

05099600 PEMBINA RIVER AT WALHALLA, N. DAK.

LOCATION.--Lat 48°55', long 97°55', in NE $\frac{1}{4}$ 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 miles downstream from Little Pembina River.

DRAINAGE AREA.--3,350 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: March 1962 to September 1968.

Water temperatures: April 1962 to September 1968.
Sediment records: April 1962 to September 1968.

EXTREMES.--1967-68:

Dissolved solids: Maximum, 755 mg/l Nov. 25 to Dec. 16; minimum, 218 mg/l Mar. 21.

Hardness: Maximum, 453 mg/l Nov. 25 to Dec. 16; minimum, 119 mg/l Mar. 21.

Specific conductance: Maximum daily, 1,140 micromhos Nov. 26; minimum daily, 320 micromhos Mar. 12.

Water temperatures: Maximum, 26.5°C July 7, 19, 22; minimum, freezing point on many days during November and February.

Sediment concentrations: Maximum daily, 4,010 mg/l Aug. 24; minimum daily, 14 mg/l Oct. 9.

Sediment loads: Maximum daily, 4,470 tons Aug. 24; minimum daily, 0.12 ton Dec. 29, Jan. 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: Maximum daily, 1,260 micromhos Mar. 4, 1967; minimum daily, 236 micromhos Apr. 11, 1965.

Water temperatures: Maximum, 31.0°C July 24, 1963; minimum, freezing point on many days during winter periods.

Sediment concentrations: Maximum daily, 13,000 mg/l July 26, 1963; minimum daily, 3 mg/l Feb. 23, 1965.

Sediment loads: Maximum daily, 65,400 tons Apr. 19, 1962; minimum daily, less than 0.50 ton on many days.

REMARKS.--Daily samples for chemical analysis composited by discharge. Flow affected by ice Nov. 13 to Apr. 8.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SiO ₂)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	PO-145-S (K)	BICARBONATE (HCO ₃)	CARBONATE (CO ₃)	SULFATE (SO ₄)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO ₃)
OCT.												
01-05	9.8	26	83	32	36	8.1	296	0	158	11	.2	.0
06-25	30	20	88	38	61	10	316	0	209	21	.2	.4
26...A	26	15	95	38	68	13	342	0	220	23	.2	.1
27-31	18	21	86	37	64	11	336	0	213	19	.3	.3
NOV.												
01-24	18	21	86	37	64	11	336	0	213	19	.3	.3
25-30	10	23	110	44	70	11	399	0	258	22	.4	.1
DEC.												
01-16	10	23	110	44	70	11	399	0	258	22	.4	.1
17-29	3.9	24	96	41	58	8.8	342	9	219	18	.3	.8
30-31	2.5	24	110	35	38	6.6	379	0	166	14	.4	.6
JAN.												
01-31	2.5	24	110	35	38	6.6	379	0	166	14	.4	.6
FEB.												
01-29	2.4	25	111	34	31	6.0	405	0	124	13	.4	1.8
MAR.												
01-07	6.3	17	58	15	14	7.0	202	0	66	7.4	.2	3.1
08-12	52	16	37	7.7	19	5.6	123	0	63	4.6	.3	5.0
13-17	101	21	48	13	27	7.0	153	0	91	8.6	.2	4.7
18-20	293	18	39	11	26	7.5	138	0	82	6.6	.2	3.5
21...B	80	13	32	9.6	18	5.9	114	0	62	4.1	.2	5.1
22...C	100	16	43	13	26	7.2	145	0	90	6.5	.2	4.9
23-24	140	16	43	11	24	7.2	143	0	79	6.2	.2	3.9
25...D	430	14	39	7.6	19	4.8	128	0	60	3.2	.2	3.2
26-31	518	16	42	9.8	21	5.1	146	0	70	4.0	.2	1.4
APR.												
01-15	182	19	53	19	37	7.5	176	0	132	10	.2	2.3
16-30	120	16	73	28	56	9.8	249	0	184	14	.2	.8
MAY												
01-07	84	22	85	30	58	11	274	0	209	15	.4	.6
08-09	157	20	81	29	61	13	265	0	216	15	.4	.7
10-13	110	22	83	29	63	10	256	0	218	14	.3	.6
14-15	175	23	75	27	66	2.8	235	0	214	14	.4	.6
16-17	158	23	85	29	66	2.7	259	0	221	14	.4	.4
18...E	154	18	85	27	63	2.5	245	0	225	13	.4	.4
19-31	111	25	83	29	63	2.8	261	0	221	14	.4	.5
JUNE												
01-30	58	23	83	31	66	10	286	0	232	14	.4	.4
JULY												
01-31	43	26	80	30	63	11	282	0	212	14	.4	.3
AUG.												
01-24	85	26	63	23	51	9.4	235	0	167	12	.4	.8
25-31	306	26	58	22	46	8.6	223	0	146	9.8	.4	.5
SEPT.												
01-21	306	26	58	22	46	8.6	223	0	146	9.8	.4	.5
22-30	421	24	52	28	47	5.0	239	0	143	11	.2	2.0
WTG. AVG. TIME												
WTG. AVG. TONS PER DAY	--	5.4	62	23	46	7.7	225	0	154	11	.3	1.2
WTG. AVG. TONS PER DAY	89.9	23	81	30	51	8.5	289	0	179	14	.3	.9
PER DAY	--	5.4	15	5.6	11	1.9	55	0	37	2.6	.1	.3

A INCLUDES 0.09 MG/L IRON (FE) AND 0.09 MG/L MANGANESE (MN).
B INCLUDES 0.82 MG/L IRON (FE) AND 0.05 MG/L MANGANESE (MN).
C INCLUDES 0.16 MG/L IRON (FE) AND 0.05 MG/L MANGANESE (MN).
D INCLUDES 0.19 MG/L IRON (FE) AND 0.08 MG/L MANGANESE (MN).
E INCLUDES 0.06 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MN).

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

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHO PHOS-PHATE (PO4)	BORON (B)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	CCLCR	
OCT.												
01-05	--	.14	514	.70	13.6	336	93	.9	768	8.1	7	
06-25	--	.15	628	.85	50.9	374	115	1.4	918	8.1	12	
26--	.11	.12	649	.91	47.0	391	110	1.5	977	7.9	17	
27-31	--	.14	641	.87	31.2	368	92	1.5	926	8.2	5	
NDV.												
01-24	--	.14	641	.87	31.2	368	92	1.5	926	8.2	9	
25-30	--	.16	755	1.03	20.4	453	126	1.4	1070	8.2	6	
DEC.												
01-16	--	.16	755	1.03	20.4	453	126	1.4	1070	8.2	6	
17-29	--	.14	662	.90	6.97	406	110	1.3	949	8.3	4	
30-31	--	.11	603	.82	4.07	417	106	.8	858	8.1	5	
JAN.												
01-31	--	.11	603	.82	4.07	417	106	.8	858	8.1	5	
FEB.												
01-29	--	.10	552	.75	3.58	417	85	.7	830	8.1	3	
MAR.												
01-07	--	.07	299	.43	5.09	206	40	.4	486	8.0	--	
08-12	--	.07	235	.32	33.0	124	23	.7	346	8.0	4-	
13-17	--	.09	317	.43	86.4	171	46	.9	461	7.7	--	
18-20	--	.09	273	.37	216	144	31	.9	408	7.4	42	
21--	1.0	.06	218	.30	47.1	119	26	.7	329	7.5	--	
22--	1.1	.08	300	.41	81.0	161	43	.9	438	7.6	--	
23-24	--	.09	292	.40	110	153	36	.8	412	7.9	37	
25--	1.1	.07	233	.32	271	128	23	.7	339	7.5	--	
26-31	--	.06	258	.35	361	145	25	.8	386	7.7	30	
APR.												
01-15	--	.11	385	.52	189	209	65	1.1	579	8.1	13	
16-30	--	.15	533	.72	173	298	94	1.4	787	8.2	13	
MAY												
01-07	--	.14	576	.78	131	335	110	1.4	841	7.6	9	
08-09	--	.16	584	.79	248	320	103	1.5	851	7.9	4-	
10-13	--	.16	595	.81	177	323	113	1.5	849	7.7	8	
14-15	--	.17	564	.79	276	296	103	1.7	815	8.0	--	
16-17	--	.22	632	.86	270	331	119	1.6	874	7.9	--	
18--	.45	.14	584	.79	243	323	122	1.5	846	7.7	15	
19-31	--	.16	555	.81	180	325	111	1.5	855	7.9	11	
JUNE												
01-30	--	.19	632	.86	99.0	333	99	1.6	908	8.0	--	
JULY												
01-31	--	.19	597	.81	69.3	322	91	1.5	870	8.0	--	
AUG.												
01-24	--	.19	494	.67	113	234	61	1.4	702	7.8	11	
25-31	--	.17	455	.62	376	254	91	1.3	656	7.8	24	
SEPT.												
01-21	--	.17	455	.62	376	234	51	1.3	656	7.8	24	
22-30	--	.16	471	.64	535	243	47	1.3	695	7.8	22	
WTD. AVG. TIME	--	.15	464	--	--	249	64	--	675	7.9	--	
WTD. AVG. TONS PER DAY	--	.15	553	.75	113	324	87	1.2	802	8.0	--	
	--	.04	--	--	--	--	--	--	--	--	--	
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	793	776	1100	864	884	466	459	820	909	757	772	630
2.....	722	910	1100	842	859	460	466	813	904	844	748	624
3.....	696	843	1020	780	873	459	547	1020	902	871	762	665
4.....	775	910	1090	745	877	441	546	814	897	875	--	678
5.....	775	910	1090	844	877	440	565	887	894	875	672	638
6.....	775	907	1080	722	873	445	546	805	894	866	668	641
7.....	779	966	1080	836	873	465	546	822	--	892	656	564
8.....	953	922	1080	836	873	333	535	850	781	866	652	569
9.....	876	920	1080	838	873	328	535	846	907	868	664	612
10.....	880	--	1060	696	976	371	571	848	899	868	639	641
11.....	882	953	1080	794	829	335	570	846	909	866	669	656
12.....	880	961	1000	704	822	320	624	826	904	857	632	647
13.....	876	966	1040	798	824	396	624	864	904	862	656	649
14.....	880	924	1080	769	810	390	746	828	--	862	664	644
15.....	908	898	1080	910	810	388	741	790	909	853	672	647
16.....	882	898	1000	735	835	526	730	871	914	872	651	641
17.....	882	832	888	785	837	522	743	839	899	824	722	644
18.....	885	966	963	991	837	347	734	841	902	825	515	644
19.....	885	963	955	963	844	427	736	824	909	859	710	644
20.....	918	963	966	960	844	425	788	778	909	838	729	647
21.....	972	963	961	966	846	0	774	820	924	846	743	650
22.....	983	1040	977	963	846	--	785	837	917	868	719	653
23.....	961	961	955	906	731	426	785	873	919	827	653	658
24.....	961	961	972	949	663	380	794	866	919	833	602	671
25.....	856	891	972	913	700	334	796	866	902	859	567	663
26.....	841	1140	927	918	736	363	787	885	909	844	654	666
27.....	927	1060	907	926	781	353	802	878	924	853	658	665
28.....	953	1130	1000	960	731	343	816	810	919	862	656	675
29.....	882	1130	1020	968	748	408	810	895	876	791	647	679
30.....	891	1130	960	891	--	403	810	897	836	846	659	675
31.....	891	--	1010	910	--	417	--	905	--	--	630	--
AVERAGE	871	958	1020	858	824	403	677	850	899	852	670	646

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	5.5	0.5	0.5	0	0.5	0.5	5.0	16.5	11.0	18.5	17.0
2	15.5	5.5	0.5	0.5	0	0.5	3.5	5.0	19.0	21.0	24.0	14.0
3	14.5	6.0	0.5	0.5	0	0.5	3.5	4.5	17.5	21.5	19.5	19.0
4	13.5	4.5	0.5	0.5	0	0.5	2.0	4.5	20.0	24.0	---	15.0
5	12.0	4.5	0.5	0.5	0	0.5	2.0	2.5	16.5	25.0	24.5	14.5
6	10.0	5.0	0.5	0.5	0	0.5	2.0	2.0	---	25.5	22.0	13.5
7	9.0	4.5	0.5	0.5	0	0.5	4.5	3.5	---	26.5	20.0	14.0
8	9.0	4.5	0.5	0.5	0	0.5	5.0	2.5	14.5	24.5	19.0	12.5
9	8.5	4.5	0.5	0.5	0	0.5	4.5	4.0	13.5	20.0	21.5	14.0
10	9.0	4.5	0.5	0.5	0	0.5	5.5	5.0	15.5	25.5	19.5	20.0
11	9.0	4.5	0.5	0.5	0	0.5	6.0	4.0	14.5	26.0	20.5	21.0
12	8.5	3.5	0.5	0.5	0	0.5	6.5	5.5	19.0	26.0	22.0	20.0
13	8.5	3.5	0.5	0.5	0	0.5	6.5	6.5	20.5	23.5	22.5	20.0
14	7.5	3.5	0.5	0.5	0	0.5	7.5	4.5	---	24.0	18.5	19.0
15	7.5	3.5	0.5	0.5	0	0.5	8.5	2.5	19.5	25.0	17.0	15.5
16	8.5	2.0	0.5	0.5	0	0.5	10.0	2.5	19.0	20.5	15.0	16.5
17	8.5	1.5	0.5	0.5	0	0.5	10.0	3.5	20.0	25.0	---	18.5
18	8.5	1.5	0.5	0.5	0	0.5	10.0	3.5	22.0	22.5	16.5	20.0
19	9.0	1.0	0.5	0.5	0	0.5	10.5	6.5	24.0	26.5	19.0	17.0
20	9.0	1.0	0.5	0.5	0	0.5	12.0	10.5	23.0	26.0	17.0	19.0
21	8.5	1.0	0.5	0.5	0	---	11.0	16.0	24.5	26.0	16.5	19.5
22	9.0	0.5	0.5	0.5	0	---	11.5	17.5	24.5	26.5	23.5	19.0
23	7.5	0	0.5	0.5	0	0.5	12.5	19.5	24.5	25.5	18.5	19.5
24	7.0	0.5	0.5	0.5	0	0.5	12.5	19.0	25.0	26.0	15.5	15.5
25	6.0	0.5	0.5	0.5	0	0.5	13.5	20.0	25.0	25.0	14.5	12.0
26	4.5	0.5	0.5	0.5	0	0.5	13.5	21.0	24.5	24.0	16.5	12.5
27	4.0	0.5	0.5	0.5	0	0.5	13.5	21.5	20.0	---	19.5	11.5
28	3.5	0.5	0.5	0.5	0	0.5	12.5	22.0	23.5	22.0	21.0	10.5
29	3.5	0.5	0.5	0.5	0	0.5	12.0	22.5	18.5	16.5	20.0	16.5
30	4.0	0.5	0.5	0.5	---	0.5	14.5	21.5	12.5	15.5	21.0	19.0
31	4.5	---	0.5	0.5	---	0.5	---	21.0	---	---	21.5	---
AVERAGE	9.5	2.5	0.5	0.5	0	0.5	8.5	10.0	20.0	23.5	19.5	16.5

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	9.0	2.0	.49	23	37	2.3	12	35	1.1
2	10	1.9	.51	23	41	2.5	10	44	1.2
3	10	4.1	1.1	24	45	2.9	10	59	1.6
4	10	6.3	1.7	24	49	3.2	9.0	54	1.3
5	10	7.2	1.9	24	35	2.3	8.5	41	.94
6	12	5.2	1.7	22	40	2.4	8.0	34	.73
7	15	5.8	2.3	20	34	1.8	8.3	19	.43
8	16	4.2	1.8	18	17	.83	8.0	31	.67
9	30	1.4	1.1	15	21	.85	8.0	27	.58
10	32	1.9	1.6	16	34	1.5	7.5	47	.95
11	30	2.0	1.6	14	34	1.3	7.5	32	.65
12	34	4.4	4.4	13	23	.81	7.5	35	.71
13	41	3.7	4.1	9.0	29	.70	7.0	42	.79
14	42	3.4	3.9	7.3	45	.89	7.0	54	1.0
15	42	3.1	3.5	13	27	.95	7.0	32	.60
16	36	3.7	3.6	11	17	.50	6.5	2.2	.39
17	34	3.5	3.0	12	25	.81	6.5	1.9	.33
18	33	2.1	1.9	12	31	1.0	6.5	3.9	.68
19	32	2.7	2.3	15	30	1.2	5.5	2.4	.36
20	31	4.1	3.4	15	30	1.2	4.5	2.1	.26
21	31	3.1	2.6	14	34	1.3	4.0	3.9	.42
22	30	2.0	1.6	15	36	1.5	4.0	2.8	.30
23	29	1.5	1.2	18	30	1.5	4.0	2.6	.28
24	27	1.9	1.4	16	22	.95	3.5	2.3	.22
25	26	2.0	1.4	16	23	.99	2.5	2.5	.17
26	26	1.5	1.1	16	26	1.1	2.5	3.1	.21
27	26	2.9	2.0	16	42	1.8	2.5	2.2	.15
28	26	3.2	2.5	16	38	1.6	2.5	2.8	.19
29	26	2.5	1.8	16	40	1.7	2.0	2.3	.12
30	25	1.8	1.2	15	33	1.3	2.0	3.1	.17
31	24	2.7	1.7	---	---	---	2.0	4.6	.25
TOTAL	805.0	--	64.40	488.3	--	43.68	186.3	--	17.75

RED RIVER OF THE NORTH BASIN

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

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	2.0	50	.27	3.6	65	.63	2.5	88	.59
2	2.0	54	.29	3.6	74	.72	2.5	118	.80
3	2.0	58	.31	3.6	80	.49	2.5	78	.53
4	1.8	59	.29	3.6	44	.43	3.0	116	.94
5	1.8	46	.22	3.6	43	.42	4.0	108	1.2
6	1.8	39	.19	3.6	42	.41	4.5	89	1.1
7	1.8	39	.19	3.4	74	.68	25	120	8.1
8	1.8	37	.18	3.2	109	.94	40	240	26
9	1.8	34	.17	3.0	58	.47	70	298	56
10	1.8	44	.21	3.0	89	.72	50	315	43
11	1.8	35	.17	2.8	142	1.1	60	231	37
12	1.8	53	.26	2.8	122	.92	40	232	25
13	1.8	42	.20	2.4	120	.78	50	208	28
14	1.8	37	.18	2.2	137	.81	40	127	14
15	1.8	40	.19	2.2	103	.61	35	135	13
16	1.8	61	.30	2.0	67	.36	30	68	5.5
17	2.0	48	.26	2.0	80	.43	350	140	132
18	2.0	31	.17	2.0	84	.45	530	410	587
19	2.2	21	.12	2.0	53	.29	250	83	56
20	2.4	65	.42	1.5	42	.17	100	88	24
21	2.6	85	.60	1.5	58	.23	80	54	12
22	3.0	68	.55	1.5	90	.36	100	48	13
23	3.6	50	.49	1.5	63	.26	100	125	34
24	3.8	34	.35	1.5	47	.19	170	348	140
25	3.8	21	.22	1.5	68	.28	430	785	911
26	3.8	22	.23	1.5	50	.20	450	1060	1240
27	3.8	45	.46	1.5	45	.18	700	1220	2310
28	3.7	48	.48	1.5	76	.31	625	1130	1910
29	3.7	61	.61	1.5	68	.28	580	1130	1770
30	3.7	76	.76	--	--	--	450	1080	1310
31	3.7	50	.50	--	--	--	300	643	521
TOTAL	77.2	--	9.84	69.6	--	14.12	5674.0	--	11300.76
DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	200	356	192	93	69	17	70	95	18
2	180	339	165	90	72	17	68	124	23
3	170	341	157	86	68	16	66	79	14
4	160	327	141	82	75	17	65	98	17
5	200	318	172	79	108	23	64	102	18
6	175	308	146	77	250	52	66	85	15
7	180	212	103	80	310	67	74	100	20
8	185	208	104	137	529	240	82	110	24
9	212	302	173	177	206	107	88	120	29
10	200	316	171	129	128	45	82	158	35
11	208	316	177	108	136	40	70	137	26
12	200	318	172	103	279	76	67	80	14
13	168	171	78	98	221	58	64	98	17
14	154	111	46	93	229	58	55	104	15
15	142	143	55	256	593	410	56	80	13
16	138	253	108	180	158	77	58	67	10
17	124	180	60	135	230	84	52	17.1	24
18	117	148	47	154	354	147	51	248	34
19	115	129	40	170	312	143	50	193	26
20	137	108	40	161	297	129	48	85	11
21	166	84	38	146	248	98	45	61	7.4
22	139	82	31	134	154	56	44	68	8.1
23	129	73	25	120	126	41	43	62	7.2
24	117	70	22	110	119	35	43	58	6.7
25	115	70	22	101	112	31	41	48	5.3
26	110	69	20	96	88	23	40	52	5.6
27	106	68	19	93	78	20	39	48	5.1
28	101	70	19	86	71	16	39	100	11
29	98	90	24	80	71	15	41	112	12
30	95	80	21	74	72	14	59	77	12
31	--	--	--	73	74	15	--	--	--
TOTAL	4541	--	2588	3601	--	2187	1730	--	483.4

RED RIVER OF THE NORTH BASIN

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

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	71	162	31	56	278	42	212	475	272
2	61	138	23	64	400	69	182	300	147
3	51	100	14	106	450	129	193	435	227
4	48	87	11.1	132	365	130	195	450	237
5	48	65	8.4	91	265	65	206	425	236
6	47	45	5.7	82	283	63	223	470	283
7	45	38	4.6	74	244	49	311	350	1320
8	44	37	4.4	74	180	36	354	1210	1160
9	42	60	6.8	96	251	65	366	925	914
10	39	64	6.7	93	213	53	370	720	719
11	38	50	5.1	79	155	33	354	515	492
12	38	38	3.9	70	102	19	336	515	467
13	37	31	3.1	71	112	21	331	415	371
14	37	45	4.5	64	105	18	329	420	373
15	34	103	9.5	60	71	12	343	730	676
16	41	110	12	62	70	12	397	780	836
17	42	74	8.4	58	58	9.1	412	600	667
18	40	60	6.5	66	882	173	382	470	485
19	36	51	5.2	98	1670	476	380	550	564
20	37	48	4.8	67	280	51	390	450	474
21	39	75	7.9	66	162	29	397	400	429
22	40	72	7.8	67	85	15	402	395	429
23	39	68	7.2	77	95	20	402	410	445
24	39	60	6.3	257	4010	4470	410	380	421
25	37	48	4.8	345	2760	2800	417	415	467
26	34	58	5.3	250	1000	675	427	420	484
27	31	62	5.7	230	560	348	433	390	456
28	32	42	3.6	236	480	306	435	400	470
29	38	50	5.1	296	465	372	435	370	435
30	39	95	15	292	435	343	427	335	386
31	60	175	28	259	365	255	--	--	--
TOTAL	1329	--	275.3	3938	--	11158.1	10451	--	15342
TOTAL DISCHARGE FOR YEAR (CFS-DAYS)									32890.4
TOTAL LOAD FOR YEAR (TONS)									43484.35

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMP- PERA- TURE (°C)	DISCHARGE (CFS)	SUSPENDED SEDIMENT		PARTICLE SIZE											METHOD OF ANALYSIS	
				CONCENTRATION (MG/L)	TRATION DISCHARGE (TONS/DAY)	PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED												
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00		
MAR 8, 1968	0830	1	41	147	16	--	--	--	--	--	97	--	--	--	--	--	--	S
MAR 18.....	1330	2	383	342	354	61	85	--	96	--	100	--	--	--	--	--	--	SPMC
MAR 21.....	1130	0	60	54	8.7	--	89	--	--	--	100	--	--	--	--	--	--	SPMC
MAR 22.....	1015	0	95	35	9.0	--	64	--	--	--	88	--	--	--	--	--	--	SPMC
MAR 23.....	1000	0	107	42	12	--	70	--	--	--	98	--	--	--	--	--	--	SPMC
MAR 24.....	1100	1	154	130	54	--	66	--	--	--	98	--	--	--	--	--	--	SPMC
MAR 25.....	0930	1	431	688	801	58	76	--	91	--	98	100	--	--	--	--	--	VPWC
MAR 25.....	1500	2	433	884	1030	37	52	--	83	--	99	100	--	--	--	--	--	VPWC
MAY 18.....	1145	4	148	342	137	62	72	--	91	--	97	97	99	100	--	--	--	VPWC
AUG 18.....	2050	17	73	2420	477	71	84	--	97	--	100	--	--	--	--	--	--	SPMC
AUG 24.....	1800	16	605	7010	11500	65	79	--	96	--	100	--	--	--	--	--	--	SPMC
PARTICLE SIZE OF 860 MATERIAL, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968																		
(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)																		
DATE	TIME	WATER TEMP- PERA- TURE (°C)	NUMBER OF PERA- SAMP- LING POINTS	DISCHARGE (CFS)	PARTICLE SIZE											METHOD OF ANALYSIS		
					PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED													
						.062	.125	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0	64.0		
OCT 26, 1967	1400		5	26	4	5	11	35	51	64	74	83	100	--	--	--	--	SV
MAY 18, 1968	1145		13	148	--	0	2	25	31	47	61	70	77	81	100	100	SV	SV

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

LOCATION.--Lat 48°09'35", long 100°43'45", in NW $\frac{1}{4}$ sec.17, T.154 N., R.78 W., McHenry County, at gaging station, 2.7 miles north of Verendrye, 7.5 miles southwest of (19 miles upstream from) mouth of Wintering River, and at mile 210.5 downstream from Canadian border.

DRAINAGE AREA (revised).--11,300 sq mi, approximately, of which about 6,900 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: October 1949 to August 1951, August 1952 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968											
DATE	DIS-CHARGE (CFS)	SILICA (SI02)	MAN-GANESE (MN)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (HC03)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)
OCT. 25:A											
At 0900	17	7.4	.14	68	39	177	16	428	254	73	.6
At 1230	17	--	--	62	38	--	--	427	--	--	--
NOV.											
22...	13	17	--	65	38	263	20	454	315	140	1.4
JAN.											
05...	6.1	24	--	103	50	250	15	624	345	88	.8
18...	5.6	31	--	123	60	294	18	736	393	114	.9
FEB.											
12...	6.1	25	--	85	49	171	13	504	278	49	.4
MAR.											
06...	23	24	--	95	44	153	12	540	251	37	.4
08...	316	7.6	--	22	11	62	11	161	95	11	.3
APR.											
03...	33	9.9	--	44	22	100	7.6	256	173	15	.3
MAY											
01...	89	5.0	--	46	25	134	12	297	180	52	.6
16...B	25	4.3	.02	63	33	158	12	410	250	37	.6
27...	12	15	--	73	35	137	9.6	433	229	24	.3
JUNE											
25...	7.0	11	--	78	35	142	10	497	191	26	.4
JULY											
16...	89	8.9	--	47	35	134	14	352	211	32	.3
26...	84	11	--	50	36	121	15	328	219	27	.2
AUG.											
26...	170	4.6	--	45	31	100	14	276	198	20	.3
SEPT.											
24...	23	3.6	--	57	33	124	12	363	230	24	.4
A INCLUDES 0.09 MG/L IRON (FE).											
B INCLUDES 0.06 MG/L IRON (FE).											

DATE	NITRATE (NO3)	ORTHO PHOSPHATE (PO4)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	COLOR
OCT. 25:											
At 0900	.5	1.2	874	1.19	40	327	0	4.3	1350	8.0	14
At 1230	--	--	867	1.18	39	313	0	--	1320	8.0	--
NOV.											
22...	16	--	1120	1.52	40	316	0	6.4	1690	7.6	28
JAN.											
05...	8.2	--	1200	1.63	19	459	0	5.1	1730	8.0	--
18...	14	--	1420	1.93	21	550	0	5.5	2030	7.9	--
FEB.											
12...	7.8	--	940	1.28	15	412	0	3.7	1390	7.8	12
MAR.											
06...	9.4	--	890	1.21	55	416	0	3.3	1300	8.1	14
09...	3.8	--	311	.42	265	98	0	2.7	491	7.4	48
APR.											
03...	.3	--	514	.70	45	199	0	3.1	782	7.4	14
MAY											
01...	14	--	638	.87	153	215	0	4.0	997	8.1	20
16...	2.7	3.5	804	1.09	54	292	0	4.0	1190	7.9	--
27...	.0	--	764	1.04	25	323	0	3.3	1130	7.7	22
JUNE											
25...	1.8	--	762	1.04	14	335	0	3.4	1140	7.8	22
JULY											
16...	2.6	--	679	.92	163	260	0	3.6	1040	7.7	--
26...	.7	--	669	.91	152	274	5	3.2	1000	7.8	--
AUG.											
26...	.1	--	571	.78	262	239	13	2.8	863	7.4	20
SEPT.											
24...	.1	--	690	.94	43	277	0	3.2	1050	7.8	15

RED RIVER OF THE NORTH BASIN

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

LOCATION.--Lat 46°59'47", long 100°57'29", in SW¼SE¼ sec.30, T.184 N., R.79 W., Bottineau County, at gaging station, 1,200 ft upstream from second crossing of international boundary, 1 mile downstream from Fish and Wildlife Service Dam 357, 7 miles northeast of Westhope, 11 miles downstream from Boundary Creek, and at mile 358.2 downstream from international boundary.

DRAINAGE AREA (revised).--18,900 sq mi, approximately, of which 10,300 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: June 1954 to September 1984. October 1988 to September 1988.

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

EXTREMES.--1987-88:

Dissolved solids: Maximum, 1,180 mg/l Oct. 1-24; minimum, 527 mg/l Sept. 7-24.

Hardness: Maximum, 397 mg/l Nov. 2-9; minimum, 212 mg/l Sept. 7-24.

Specific conductance: Maximum daily, 1,840 micromhos Oct. 5; minimum daily, 765 micromhos Sept. 10.

Water temperatures: Maximum, 28.0°C July 5, 12; minimum, 1.0°C on several days during October and November.

Period of record:

Dissolved solids: Maximum, 3,850 mg/l Feb. 8-28, 1981; minimum, 182 mg/l Apr. 13-18, 1957.

Hardness: Maximum, 1,570 mg/l Feb. 8-28, 1981; minimum, 85 mg/l Apr. 13-18, 1957.

Specific conductance: Maximum daily 4,750 micromhos Feb. 21, 1981; minimum daily, 232 micromhos Apr. 18, 1957.

Water temperatures: Maximum (1959-84, 1988-88), 28.0°C July 14, 19, 1980; minimum, freezing point on many days during winter periods.

REMARKS.--Daily samples for chemical analysis composited by discharge. Very low flow or no flow Nov. 10 to Apr. 30.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SI02)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCD3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)
OCT.												
01-24	25	26	55	60	228	22	551	0	346	57	.6	14
25...A	21	17	65	56	201	21	526	0	314	47	.4	10
26-31	26	13	67	55	198	21	527	0	306	46	.3	13
NOV.												
01... 26	13	67	55	198	21	527	0	306	46	.3	13	
02-09	1.6	12	65	57	179	21	481	13	311	48	.4	12
APR.												
23... .35	6.9	35	35	110	15	333	0	160	27	.2	12	
MAY												
01-11	1.6	6.9	45	40	118	18	344	0	214	33	.2	11
12-15	20	4.1	50	42	113	19	345	0	225	24	.3	3.1
16...B	34	3.7	51	44	115	18	346	0	242	27	.2	2.0
17-31	3.5	6.9	50	48	126	19	368	0	258	31	.3	4.9
JUNE												
01... 3.5	6.9	50	48	126	19	368	0	258	31	.3	4.9	
02-30	25	4.1	53	57	150	22	438	0	275	36	.3	5.4
JULY												
01-31	20	10	42	50	179	10	378	0	331	44	.5	7.0
AUG.												
01-31	22	10	36	33	147	17	355	0	223	42	.5	4.8
SEPT.												
01-06	103	17	35	33	107	16	375	0	135	29	.4	5.0
07-24	227	24	36	30	83	14	328	0	115	24	.3	3.7
25-30	208	26	38	30	85	14	338	0	120	24	.3	2.7
TIME												
MTD. AVG.	C46	13	46	46	152	17	405	1	257	39	.4	7.2

A INCLUDES 0.09 MG/L IRON (FE) AND 0.00 MG/L MANGANESE (MNI).

B INCLUDES 0.07 MG/L IRON (FE) AND 0.04 MG/L MANGANESE (MNI).

C MEAN DISCHARGE FOR 194 DAYS OF CHEMICAL ANALYSES; MEAN DISCHARGE BASED ON 366 DAYS, 24.5 CFS.

DATE	ORTHOPHOSPHATE (PO4)	BORON (B)	DIS-SOLVED SOLIDS (RESI-180 C)	DIS-SOLVED SOLIDS (TOMS AC-FT)	DIS-SOLVED SOLIDS (TOMS PER DAY)	HARON-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SODIUM AO-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH	COLOR
OCT.											
01-24	--	.27	1160	1.58	78.3	384	0	5.1	1620	7.7	--
25...	.67	.24	1020	1.39	57.8	390	0	4.4	1460	7.8	--
26-31	--	.25	1030	1.40	72.3	393	0	4.3	1460	8.0	--
NOV.											
01...	--	.25	1030	1.40	72.3	393	0	4.3	1460	8.0	--
02-09	--	.24	1020	1.39	4.41	397	0	3.9	1460	8.4	--
APR.											
23...	--	.17	670	.91	.63	233	0	3.1	908	7.8	--
MAY											
01-11	--	.20	710	.97	3.07	276	0	3.1	1010	8.1	--
12-15	--	.20	730	.99	39.4	295	13	2.9	1020	8.0	--
16...	.24	.18	717	.98	65.8	306	22	2.9	1080	7.7	--
17-31	--	.21	778	1.06	7.35	322	20	3.1	1140	7.5	--
JUNE											
01...	--	.21	778	1.06	7.35	322	20	3.1	1140	7.5	--
02-30	--	.28	891	1.21	60.1	363	4	3.4	1290	7.8	--
JULY											
01-31	--	.31	938	1.28	50.7	308	0	4.4	1330	7.9	48
AUG.											
01-31	--	.26	758	1.03	45.2	226	0	4.2	1090	7.8	54
SEPT.											
01-06	--	.26	600	.82	167	225	0	3.1	901	8.0	--
07-24	--	.25	527	.72	323	212	0	2.5	789	7.9	--
25-30	--	.22	550	.75	309	220	0	2.5	814	7.7	--
TIME											
MTD. AVG.	--	.26	843	1.19	83.7	304	3	3.8	1210	7.8	--

RED RIVER OF THE NORTH BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1.....	1760	1500	--	--	--	--	--	936	1190	1340	1190	--
2.....	1800	1450	--	--	--	--	--	936	1190	1350	1220	1060
3.....	1770	1450	--	--	--	--	--	936	1220	1350	1150	1040
4.....	1780	1450	--	--	--	--	--	970	1220	1360	1180	997
5.....	1840	1490	--	--	--	--	--	964	1230	1360	1180	926
6.....	1820	1510	--	--	--	--	--	955	1240	1360	1160	832
7.....	1720	1530	--	--	--	--	--	964	1250	1330	1110	772
8.....	1570	1500	--	--	--	--	--	955	1270	1340	1110	769
9.....	1570	1500	--	--	--	--	--	1060	1270	1340	1110	767
10.....	1630	--	--	--	--	--	--	1070	1270	1340	1140	765
11.....	1650	--	--	--	--	--	--	994	1270	1370	1110	784
12.....	1660	--	--	--	--	--	--	1010	1280	1400	1090	780
13.....	1620	--	--	--	--	--	--	1040	1260	1380	1100	780
14.....	1560	--	--	--	--	--	--	1010	1260	1400	1090	789
15.....	1560	--	--	--	--	--	--	1020	1260	1380	1070	789
16.....	1560	--	--	--	--	--	--	1080	1260	1330	1050	787
17.....	1580	--	--	--	--	--	--	1110	1270	1310	1040	784
18.....	1580	--	--	--	--	--	--	1110	1270	1310	1040	805
19.....	1520	--	--	--	--	--	--	1130	1290	1290	1030	801
20.....	1480	--	--	--	--	--	--	1130	1300	1300	1040	805
21.....	1480	--	--	--	--	--	--	1130	1300	1320	1030	809
22.....	1480	--	--	--	--	--	--	1100	1340	1310	1030	799
23.....	1480	--	--	--	--	--	908	1120	1330	1300	1040	809
24.....	1460	--	--	--	--	--	--	1130	1330	1260	1010	819
25.....	1460	--	--	--	--	--	--	1160	1340	1260	1020	814
26.....	1450	--	--	--	--	--	--	1150	1360	1260	1000	--
27.....	1480	--	--	--	--	--	--	1150	1370	1210	1000	--
28.....	1540	--	--	--	--	--	--	1180	1360	1210	1010	--
29.....	1560	--	--	--	--	--	--	1190	1390	1210	1010	--
30.....	1420	--	--	--	--	--	--	1180	1390	1210	1030	--
31.....	1380	--	--	--	--	--	--	1210	--	1200	1060	--
AVERAGE	1590	--	--	--	--	--	--	1070	1290	1310	1080	828

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

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

LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MINN.
(Hydrologic bench-mark station)

LOCATION.--Lat 47°55'22", long 91°32'06", in SE¼ sec.24, T.63 N., R.10 W., Lake County, at gaging station, on left bank upstream from rapids, 2 miles upstream from South Kawishiwi River, 2.2 miles southwest of Fernsberg Lookout Tower and 14 miles east of Ely.

DRAINAGE AREA.--253 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1966 to August 1967 (miscellaneous); October 1967 to September 1968, Water temperatures: July 1966 to September 1968.

EXTREMES.--1967-68:
Water temperatures: Maximum, 21.0°C July 17 to Aug. 19; minimum, freezing point on many days in February and March.

Period of record:
Water temperatures: Maximum, 24.0°C July 24, 25, 1966; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Mar. 27 to Apr. 29; range in temperature, 1.0°C to 6.0°C.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	TEMPERATURE (DEG C)	SILICA (SIO2)	TOTAL IRON (FE)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	PD-TAS-SIUM (KI)	BICARBONATE (MCO3)	CHLORIDE (CO3)	ALKALINITY AS CaCO3
NOV. 02...	31	6	3.5	.13	3.0	1.0	1.1	.2	10	0	8
JAN. 03...	33	1	4.0	.14	4.0	1.5	1.6	.8	19	C	16
FEB. 01...	37	1	4.1	.10	3.8	1.5	1.3	1.6	18	0	15
27...	29	1	4.1	.12	3.8	1.5	1.5	.8	18	C	15
MAR. 26...	38	1	4.0	.08	3.8	1.5	1.2	.8	17	C	14
MAY 02...	1030	7	3.3	.18	3.2	1.3	.9	1.0	13	0	11
29...	947	11	3.4	.20	3.3	1.4	1.2	.4	12	0	10
JUNE 19...	1200	17	3.6	.18	3.2	1.4	.9	.4	12	0	10
JULY 03...	698	16	3.5	.19	3.4	1.4	1.0	.4	12	C	10
AUG. 06...	204	22	2.8	.12	3.7	1.4	1.0	.6	14	C	11
SEPT. 11...	100	17	3.6	.08	3.7	1.5	1.0	.4	13	0	11

DATE	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	ORTHO PHOSPHATE (PO4)	PHOSPHATE (PO4)	TOTAL ALUMINIUM (AL)	BORON (B)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	DIS-SOLVED SOLIDS (TCAS PER AC-FT)	DIS-SOLVED SOLIDS (TCAS PER DAY)
NOV. 02...	4.5	.3	.0	.4	--	.01	.5	.02	20	.05	2.87
JAN. 03...	5.0	.7	.1	.4	.03	.17	.5	.01	28	.08	5.26
FEB. 01...	6.0	.4	.1	.4	.03	.28	.4	.01	28	.06	4.69
27...	5.5	.3	.1	.5	.03	.20	.5	.00	27	.07	3.69
MAR. 26...	6.0	.2	.0	.5	.07	.17	.4	.00	27	.06	4.91
MAY 02...	3.5	.2	.0	.4	.02	.26	.6	.04	21	.04	91.8
29...	4.3	.6	.0	.5	.03	.12	.0	.03	21	.05	56.1
JUNE 19...	4.3	.3	.0	.7	.04	1.0	.9	.04	22	.05	123
JULY 03...	4.3	.3	.0	.7	.59	.31	.8	.03	22	.06	77.3
AUG. 06...	5.0	.8	.1	.6	.07	.24	1.0	.01	24	.05	15.8
SEPT. 11...	5.0	.6	.0	.5	.10	.16	.7	.04	24	.05	9.99

DATE	HARDNESS (CA+MG)	NON-CARBONATE HARDNESS	SODIUM AD-SORPTION RATIO	PERCENT SODIUM	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
NOV. 02...	12	4	.1	17	35	6.3	45
JAN. 03...	16	0	.2	17	40	7.1	31
FEB. 01...	16	1	.1	14	40	7.0	24
27...	16	1	.2	16	38	7.1	41
MAR. 26...	16	2	.1	14	37	7.0	28
MAY 02...	13	2	.1	12	31	6.6	50
29...	14	4	.1	15	34	6.4	40
JUNE 19...	14	4	.1	12	31	6.4	50
JULY 03...	14	4	.1	13	32	6.4	50
AUG. 06...	15	3	.1	12	33	6.7	45
SEPT. 11...	15	4	.1	12	35	6.7	40

LAKE OF THE WOODS BASIN

05124480 KAWISHIMI RIVER NEAR ELY, MINN.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

Month	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	Average	
October																																	
Maximum	15	15	14	13	13	13	13	13	12	11	11	10	10	10	10	10	10	10	10	9	9	9	8	8	8	8	8	7	6	6	6	10	
Minimum	15	14	13	13	13	13	12	11	10	9	10	10	10	10	10	10	10	10	9	9	8	8	8	8	8	7	6	6	6	6	10		
November																																	
Maximum	6	6	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	4		
Minimum	6	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	4			
December																																	
Maximum	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	
Minimum	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	
January																																	
Maximum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
February																																	
Maximum	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minimum	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
March																																	
Maximum	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Minimum	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
April																																	
Maximum																																	7
Minimum																																	6
May																																	
Maximum	7	7	7	7	7	7	7	7	7	7	8	8	8	9	9	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	
Minimum	7	7	7	7	7	7	7	7	7	7	8	8	8	9	9	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	9	
June																																	
Maximum	11	11	12	13	14	14	14	15	16	16	16	16	16	17	17	17	17	17	17	16	16	16	16	16	16	16	16	16	16	16	16	16	
Minimum	11	11	11	12	13	14	14	14	15	16	16	16	16	17	17	17	17	17	16	16	16	16	16	16	16	16	16	16	16	16	16	15	
July																																	
Maximum	16	16	16	17	17	17	18	18	18	18	18	18	18	18	19	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	
Minimum	16	16	16	16	17	17	17	18	18	18	18	18	18	18	18	19	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19	
August																																	
Maximum	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20	19	19	19	19	20	
Minimum	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20	19	19	19	19	19	20	
September																																	
Maximum	19	19	19	19	19	19	18	17	17	17	17	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	15	--	17	
Minimum	19	19	19	19	18	17	17	17	17	16	16	16	16	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	15	--	17		

RADIOCHEMICAL ANALYSES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Units of measurement: Uranium, micrograms per liter of water; radium as radium-226, in picocuries per liter of water; gross beta radiation as strontium-90-yttrium-90, in picocuries per liter of water; gross alpha radiation, as micrograms of uranium equivalent per liter of water.

Date of Collection	Dissolved				Total				Suspended		
	Uranium (ug/L)	Radium (pc/L)	Gross β (pc/L)	Gross α (ug/L)	Dissolved solids (mg/L)	Gross β (pc/L)	Gross α (ug/L)	Suspended solids (mg/L)			
Nov. 2, 1967...	<0.4	<0.1	5.1	0.7	34	1.6	0.7	<1			
May 2, 1968...	<.4	<.1	5.9	<.4	34	2.1	<.4	4			

DETERMINATIONS OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)	Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)
Jan. 3, 1968	33	1	.09	July 3, 1968	698	4	7.5
May 2	1030	2	5.6	Aug. 6	204	2	1.1
May 29	547	3	4.4				
June 19	1200	4	13	Sept. 11	100	2	.54

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MINN.

LOCATION.--Lat 45°07'36". long 93°17'48", in SW 1/4 sec 12, T.119 N., R.21 W., Hennepin County, at gaging station on right bank a mile downstream from Coon Creek, 1.5 miles downstream from hydroelectric plant of Northern States Power Co. at Coon Rapids, 6.5 miles downstream from Anoka, and at mile 864.8 upstream from Ohio River.

DRAINAGE AREA.--19,100 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: August 1960 to September 1965, October 1967 to September 1968. Water temperatures: August 1960 to September 1963.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SiO2)	TOTAL IRON (FE)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	LITHIUM (LI)	BICAR-ONATE (HC03)	CAR-BONATE (CC3)
OCT. 26...	3090	6	3.7	.01	45	17	--	8.5	2.6	--	222	0
NOV. 20...	3200	2	3.5	.14	44	16	.10	6.6	2.2	.00	210	0
DEC. 14...	2420	0	9.0	.02	49	18	--	9.0	2.3	--	236	0
JAN. 23...	2540	0	13	.03	52	18	--	7.7	2.3	--	244	0
FEB. 20...	2300	0	14	.04	50	17	--	6.9	2.5	--	242	0
MAR. 25...	5980	2	11	.06	38	13	--	5.9	3.6	--	178	0
APR. 15...	8480	8	5.8	.06	39	14	.19	6.4	2.8	.00	180	0
MAY 21...	9060	10	8.6	.05	43	14	--	5.8	2.5	--	184	0
JUNE 21...	18400	18	13	.17	39	12	--	4.2	2.5	--	160	0
AUG. 01...	7130	22	12	.05	42	14	--	5.6	2.4	--	184	0
SEPT. 04...	3520	20	8.6	.01	41	15	--	5.8	1.6	--	194	0

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MINN.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR 1967 TO SEPTEMBER 1968

DATE	ALKA- LINITY AS CaCO ₃	SULFATE (SO ₄)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO ₃)	DPTHO PHOS- PHATE (PO ₄)	TOTAL ALUM- INIUM (AL)	BORON (B)	COPPER (CU)	ZINC (ZN)	CAC- MILP (CD)	DATE	TOTAL	NICKEL	COBALT	LEAD	DIS-	DIS-	DIS-
													CHRO- MIUM (CR)	(NI)	(CO)	(PB)	SOLVED SOLIDS (SUM OF CONSTI- TUENTS)	SOLVED SOLIDS (TONS PER AC-FT)	SOLVED SOLIDS (TONS PER DAY)
OCT.																			
26...													--	--	--	--	203	.30	1840
NOV.																			
2...	182	12	5.0	.1	.0	.12	.4	.03	--	--	--		.00	.00	.00	.01	193	.27	1730
DEC.																			
14...	172	12	4.2	.1	.1	.07	.2	.03	.00	.00	.00		--	--	--	--	224	.31	1500
JAN.																			
23...	193	14	5.0	.1	.7	.10	.4	.02	--	--	--		--	--	--	--	232	.33	1640
FEB.																			
20...	200	13	4.2	.1	.9	.24	.3	.08	--	--	--		--	--	--	--	230	.34	1530
MAR.																			
25...	198	13	4.6	.1	1.6	.46	.3	.02	--	--	--		--	--	--	--	182	.26	3120
APR.																			
15...	146	16	4.6	.1	1.4	.34	.4	.02	--	--	--		--	--	--	--	179	.26	4440
MAY																			
21...	148	17	4.8	.2	.2	.24	.0	.03	.00	.00	.00		--	--	--	--	177	.27	10000
JUNE																			
21...	151	21	3.9	.2	1.1	.33	.0	.03	--	--	--		--	--	--	--	191	.28	5110
AUG.																			
01...	131	21	3.7	.3	1.6	.31	.8	.06	--	--	--		--	--	--	--	177	.27	10000
SEPT.																			
04...	151	14	4.6	.2	1.3	.36	.8	.02	--	--	--		--	--	--	--	187	.28	3990
	169	13	3.4	.2	.5	.39	.6	.04	--	--	--		--	--	--	--	185	.27	1900

DATE	HARD- NESS (Ca, MG)	NON- CAR- BONATE HARD- NESS	SOCIUM AD- SORP- TION RATIO	PERCENT SOCIUM	SPECI- FIC CONDU- CTANCE (MICRO- MHOS)	PH	COLOR
26...	182	0	.3	9	365	7.8	4
NOV.							
20...	177	5	.2	7	357	7.4	8
DEC.							
14...	156	3	.3	9	387	8.1	9
JAN.							
23...	203	3	.2	7	399	7.9	4
FEB.							
20...	195	0	.2	7	393	8.0	8
MAR.							
25...	148	2	.2	8	316	7.6	18
APR.							
15...	154	6	.2	8	328	7.7	8
MAY							
21...	164	13	.2	7	335	7.9	22
JUNE							
21...	146	15	.2	6	298	7.9	50
AUG.							
01...	160	10	.2	7	321	7.7	25
SEPT.							
04...	163	4	.2	7	328	7.5	4

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, S. DAK.

LOCATION.--Lat 45°17'32", long 96°29'14", in SE¼NW¼ sec.18, T.121 N., R.46 W., Grant County at gaging station on right bank 20 ft downstream from highway bridge, 1.5 miles west of Big Stone City, and 4.5 miles upstream from Big Stone Lake.

DRAINAGE AREA.--389 sq mi.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1968.

DATE	CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968										
	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIC2)	TOTAL IRON (FE)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (MG03)	CAR-BONATE (CO3)	ALKA-LINITY #5 CAC03
OCT.											
06...	--	--	15	.08	108	56	63	9.2	338	C	277
28...	4.1	0	18	.20	122	55	44	8.4	366	C	300
NDV.											
06...	4.9	2	20	.03	125	55	42	7.4	370	C	313
28...	5.2	0	20	.01	145	73	71	9.3	432	C	354
JAN.											
09...	.20	0	34	.01	215	90	94	12	676	C	554
FEB.											
06...	2.0	1	28	.02	136	61	44	8.0	402	C	344
MAR.											
05...	6.6	1	19	.05	95	39	24	7.6	284	C	233
20...	12	0	16	.05	100	39	85	8.8	248	C	203
APR.											
02...	6.9	6	7.8	.11	103	48	55	8.2	252	C	207
MAY											
01...	23	17	10	.08	149	63	55	11	284	C	233
21...	12	18	12	.06	155	70	72	10	336	C	276
22...	9.6	16	15	.05	148	67	67	8.7	355	C	251
JULY											
02...	5.4	17	18	.02	116	55	69	8.9	334	C	274
SEPT.											
04...	2.3	--	--	--	105	51	44	8.7	341	C	280

DATE	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	ORTHOPHOSPHATE (PO4)	TOTAL ALUMINIUM (AL)	BORON (B)	DIS-SOLVED SOLIDS (SUM OF TUENTS)	DIS-SOLVED SOLIDS (TOAS AC-FT)	DIS-SOLVED SOLIDS (TCAS PER DAY)
								(SUM OF TUENTS)	(TOAS AC-FT)	(TCAS PER DAY)
OCT.										
06...	289	52	.3	.1	.45	--	.20	759	1.11	--
28...	263	30	.5	.2	.26	--	.16	722	1.04	8.47
NDV.										
06...	266	28	.2	.3	.44	--	.14	726	1.05	10.2
28...	372	42	.2	.1	.29	1.2	.21	946	1.36	14.3
JAN.										
09...	445	61	.3	.1	.77	.6	.33	1290	1.84	.73
FEB.										
06...	328	23	.2	4.4	.33	.9	.15	841	1.23	5.05
MAR.										
05...	204	12	.2	1.2	.62	.6	.10	544	.78	10.3
20...	277	62	.2	12	6.1	--	.26	729	1.03	24.6
APR.										
02...	308	26	.4	.2	.71	.8	.22	682	1.01	13.8
MAY										
01...	463	22	.3	.1	.60	.0	.22	914	1.34	61.2
21...	468	34	.3	.6	.61	--	.28	988	1.47	35.0
28...	430	26	.3	.1	.74	.4	.04	938	1.27	26.2
JULY										
02...	318	42	.3	.1	1.1	.3	.23	793	1.14	12.3
APR.										
SEPT.										
04...	253	24	--	.5	--	--	.19	--	.98	4.50

05316770 MINNESOTA RIVER AT NEW ULM, MINN.

LOCATION.--Lat 44°19'29", long 94°27'09", in NE¼NE¼ sec.20, T.110 N., R.30 W., Nicollet County, at gaging station on left bank, 30 ft downstream from bridge on U.S. Highway 14, at New Ulm, and 6.1 miles upstream from Cottonwood River.

DRAINAGE AREA.--9,536 sq mi (at mouth of Cottonwood River).

PERIOD OF RECORD.--Water temperatures: October 1967 to September 1968.

Sediment records: October 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 26.0°C July 15, 16, Aug. 23; minimum, freezing point on many days.
Sediment concentrations: Maximum daily, 567 mg/l June 12; minimum daily, 10 mg/l Mar. 22.
Sediment loads: Maximum daily, 2,150 tons July 28; minimum daily, 7.6 tons Jan. 15.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968 (ONCE-DAILY MEASUREMENT, BETWEEN 0700 AND 1200)

MONTH	DAY																															AVER-AGE	
	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		
OCTOBER..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOVEMBER.	--	--	--	--	--	--	--	2	--	--	--	--	--	--	--	--	4	2	2	1	1	2	3	0	0	--	--	--	--	--	--	--	
DECEMBER.	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	1	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--
JANUARY..	--	--	--	--	0	--	--	--	--	--	0	--	1	--	--	--	--	2	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--
FEBRUARY.	--	2	--	--	--	--	--	1	--	--	--	--	--	2	--	0	--	--	--	--	2	--	--	--	--	--	--	--	--	8	--	--	--
MARCH....	--	0	--	--	--	--	2	--	--	--	2	--	1	--	3	1	0	1	1	1	3	6	7	6	8	9	8	9	8	--	--	--	
APRIL....	7	8	9	5	6	7	7	6	6	7	9	12	12	8	8	10	12	10	12	12	13	11	6	8	9	10	11	12	13	--	--	9	
MAY.....	17	19	17	14	12	12	11	9	9	11	11	13	15	16	12	13	14	11	13	11	13	13	14	14	14	12	13	15	16	16	13	--	
JUNE.....	15	18	18	21	23	24	25	25	24	24	23	20	21	19	19	19	20	20	21	20	20	22	21	18	21	19	--	15	17	19	22	--	20
JULY.....	19	18	17	21	21	22	25	24	23	22	22	24	23	25	26	26	25	25	23	23	24	22	22	21	21	24	21	20	20	21	19	22	22
AUGUST...	19	20	21	22	23	25	22	23	24	21	19	20	21	20	21	20	20	20	20	20	23	25	26	24	21	19	19	19	19	20	19	21	22
SEPTEMBER	18	17	19	21	18	16	16	17	14	14	14	14	16	18	17	19	17	17	16	15	16	17	17	--	17	13	15	14	14	13	--	16	

MINNESOTA RIVER BASIN

05316770 MINNESOTA RIVER AT NEW ULM, MINN.--Continued

SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (METHODS OF ANALYSIS: B. BOTTOM WITHDRAWAL TUBE; C. CHEMICALLY DISPERSED; N. IN NATIVE WATER; P. PIPET; S. SIEVE;
 V. VISUAL ACCUMULATION TUBE; W. IN DISTILLED WATER)

DATE	TIME	WATER TEM- PERA- TURE (C)	DISCHARGE (CFS)	CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	SUSPENDED SEDIMENT										METHOD OF ANALY- SIS	
						PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED											
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	
JUNE 12	0800	20	1170	638	2020	53	61	84	92	97	99						CPW
JUNE 15	0800	26	697	242	506	62	72	85	92	94							BCW
JULY 25	0800	21	756	230	449	70	79	91	96	98							BCW
AUG. 7	0800	22	878	560	1370	57	59	83	86	88	99						CPW

PARTICLE SIZE ANALYSES OF BED MATERIAL, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (METHODS OF ANALYSIS: H. HYDROMETER; O. OPTICAL ANALYZER; S. SIEVE; V. VISUAL ACCUMULATION TUBE)

DATE	TIME	NO. OF SAMPLING POINTS	DISCHARGE (CFS)	PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED									METHOD OF ANALYSIS				
				0.016	0.031	0.062	0.125	0.25	0.354	0.50	1.000	2.000		4.000	7.9		
JULY 11	1605	4	407			8	13	24	33			56	69	82	88	5	
AUG. 8	1545	4	1060			6	14	25	30			46	58		82	5	

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Day	OCTOBER			NOVEMBER			DECEMBER			Total
	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)	
1	128	130	45	148	130	52	110	150	45	
2	128	130	45	148	130	52	121	150	49	
3	128	130	45	148	130	52	123	150	50	
4	128	130	45	148	130	52	125	150	51	
5	128	130	45	148	130	52	127	150	51	
6	128	130	45	149	130	52	125	150	51	
7	128	130	45	148	130	52	123	150	50	
8	128	130	45	146	130	51	128	150	52	
9	130	130	46	142	130	50	134	150	54	
10	130	130	46	141	130	49	136	150	55	
11	130	130	46	140	130	49	144	150	58	
12	130	130	46	138	130	48	146	156	61	
13	130	130	46	136	130	48	123	150	50	
14	131	130	46	145	130	51	107	140	40	
15	132	130	46	155	130	54	116	100	31	
16	138	130	48	161	130	56	119	60	19	
17	139	130	49	160	130	56	128	70	24	
18	140	130	49	152	130	53	130	90	32	
19	160	130	56	154	150	62	130	110	39	
20	200	130	70	152	153	63	136	130	48	
21	160	130	56	150	161	65	136	150	55	
22	140	130	49	144	148	58	114	150	46	
23	138	130	48	142	134	51	109	157	46	
24	138	130	48	138	140	52	114	160	49	
25	128	130	45	140	144	55	99	160	43	
26	132	130	46	142	206	79	84	160	36	
27	138	130	48	92	208	52	68	160	29	
28	142	130	50	105	200	57	73	160	32	
29	143	130	50	112	200	60	68	160	29	
30	149	130	52	105	200	57	65	160	28	
31	150	130	53	--	--	--	64	160	28	
Total	4272		1499	4229		1638	3525		1331	
JANUARY										
1	64	170	29	56	240	36	60	220	36	
2	62	170	28	58	240	38	60	220	36	
3	59	170	27	59	230	37	60	220	36	
4	57	180	28	60	200	32	60	220	36	
5	54	180	26	61	161	27	62	220	36	
6	53	184	26	62	161	27	66	150	27	
7	52	184	26	62	161	27	74	120	24	
8	51	174	24	64	161	28	90	110	27	
9	49	164	22	64	161	28	110	110	33	
10	48	154	20	64	161	28	140	100	38	
11	46	144	18	64	161	28	180	90	44	
12	45	134	16	63	161	27	250	80	54	
13	44	134	16	63	161	27	310	70	59	
14	43	90	10	62	130	22	305	60	49	
15	42	67	7.6	62	108	18	300	40	32	
16	43	90	10	61	108	18	290	14	11	
17	44	130	15	60	108	17	330	21	19	
18	44	160	19	59	140	22	355	35	34	
19	42	200	23	57	190	29	363	58	57	
20	43	250	29	57	190	29	355	18	17	
21	43	250	29	57	190	29	355	15	14	
22	43	250	29	57	200	31	360	10	9.7	
23	44	250	30	57	210	32	365	11	11	
24	45	250	30	58	220	34	566	15	23	
25	46	250	31	60	220	36	756	25	51	
26	47	250	32	60	220	36	794	26	56	
27	48	250	32	60	220	36	707	40	76	
28	50	250	34	60	220	36	641	53	92	
29	51	250	34	60	220	36	629	65	110	
30	51	250	35	--	--	--	623	62	155	
31	54	250	36	--	--	--	569	100	154	
Total	1508		771.6	1747		831	10185		1445.7	

05316770 MINNESOTA RIVER AT NEW ULM, MINN.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Day	APRIL			MAY			JUNE		
	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)
1	551	102	152	934	193	487	428	178	206
2	512	100	138	914	170	420	467	166	209
3	449	93	113	892	176	424	527	150	213
4	464	62	78	850	148	340	527	167	238
5	479	35	45	791	118	252	491	207	274
6	563	58	88	710	110	211	452	232	283
7	539	65	95	696	110	207	419	208	235
8	509	52	71	693	96	180	417	166	187
9	494	95	127	650	82	144	410	155	172
10	539	126	183	635	100	171	533	185	266
11	575	163	253	590	65	135	1040	369	1040
12	596	139	224	548	65	96	1170	567	1790
13	656	135	239	530	94	135	1110	318	953
14	638	110	189	518	110	154	1120	284	859
15	611	102	168	491	100	133	1070	263	760
16	569	132	203	470	95	121	942	212	539
17	578	122	190	464	118	148	822	204	453
18	554	140	209	467	120	151	753	223	459
19	542	125	183	458	130	161	728	257	505
20	566	123	188	446	134	161	718	247	479
21	728	130	256	437	157	185	686	240	444
22	822	130	288	428	124	143	656	235	416
23	875	116	274	422	133	152	653	225	397
24	868	152	356	419	140	158	679	203	372
25	1010	168	458	410	147	163	710	197	378
26	1120	152	460	407	130	143	734	134	258
27	1190	172	553	419	123	139	690	105	196
28	1210	157	513	416	160	180	700	118	223
29	1150	192	596	413	151	168	696	114	214
30	1050	156	442	392	148	157	710	125	240
31	--	--	--	404	135	147	--	--	--
Total	21007		7332	17314		5966	21048		13258
Day	JULY			AUGUST			SEPTEMBER		
	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/L)	Load (tons per day)
1	704	138	262	2170	237	1390	168	218	99
2	714	120	231	1960	147	778	164	211	93
3	742	124	248	1350	112	408	162	269	118
4	732	117	231	930	125	314	160	261	113
5	700	133	251	611	133	219	164	257	114
6	644	125	217	506	114	156	162	267	117
7	596	102	164	878	495	1170	156	210	88
8	524	107	151	1050	275	1060	150	238	96
9	461	96	119	1030	200	584	222	230	138
10	437	107	126	728	196	385	292	186	147
11	410	98	108	672	195	354	275	158	117
12	395	102	109	503	183	249	240	168	109
13	458	93	115	440	184	219	226	190	116
14	605	119	194	353	185	176	212	191	109
15	840	230	522	295	182	145	188	168	85
16	732	227	449	285	175	135	174	183	86
17	686	295	454	258	155	108	344	136	126
18	679	273	500	230	153	101	410	129	143
19	696	305	573	234	148	94	392	130	138
20	608	250	410	226	157	96	347	138	129
21	521	220	309	206	170	95	431	140	163
22	485	206	270	218	197	116	672	118	214
23	506	272	371	198	207	111	950	98	251
24	700	258	488	194	196	103	1250	87	294
25	728	226	444	174	218	102	1060	83	238
26	836	189	427	180	242	118	730	112	221
27	2010	240	1300	174	221	104	467	167	211
28	2770	288	2150	162	250	109	371	217	217
29	2540	227	1560	168	259	117	270	205	149
30	1960	238	1260	156	220	93	247	195	130
31	2140	266	1540	164	262	116	--	--	--
Total	27559		15553	16703		9325	11056		4369

Total Discharge for year (cfs-days)

Total Load for year (tons)

1401537

63319.3

05325000 MINNESOTA RIVER AT MANKATO, MINN.

LOCATION.--Lat 44°10'10", long 94°00'15", in sec.7, T.108 N., R.26 W., Nicollet County, at gaging station on left bank at downstream side of Main Street Bridge in Mankato, 1.8 miles downstream from Blue Earth River, and at mile 106.4 upstream from Mississippi River.

DRAINAGE AREA.--14,900 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1963 to August 1966.

Water temperatures: October 1967 to September 1968.

Sediment records: October 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 28.0°C July 8; minimum, freezing point on many days.
Sediment concentrations: Maximum daily, 2,850 mg/l Aug. 7; minimum daily, 20 mg/l Mar. 23.
Sediment loads: Maximum daily, 80,200 tons Aug. 7; minimum daily, 14 tons Jan. 13, 14.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(ONCE-DAILY MEASUREMENT, BETWEEN 0700 AND 1200)

MONTH	DAY																															AVER- AGE
	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	
OCTOBER..	--	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
NOVEMBER.	--	--	--	--	--	--	2	4	6	6	5	3	4	4	4	6	4	2	3	3	1	2	3	3	1	1	1	0	1	--		
DECEMBER.	1	0	2	1	1	1	2	--	--	2	1	1	0	0	1	1	1	1	2	--	--	1	--	--	--	--	--	--	0	--		
JANUARY..	--	--	--	--	--	1	--	--	--	--	--	0	--	1	--	--	--	--	--	1	--	--	--	--	--	--	0	--	--	--		
FEBRUARY.	--	--	--	--	--	--	--	0	--	--	1	--	--	0	--	--	0	--	--	0	--	--	0	--	--	--	--	--	--	--		
MARCH....	--	2	--	--	--	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	--	1	1	2	6	5	8	7	9	9		
APRIL....	7	8	9	7	4	6	7	7	7	8	10	13	11	10	8	11	11	13	12	12	14	12	8	7	9	11	11	12	13	--		
MAY.....	15	17	17	14	12	14	11	11	10	12	11	14	16	17	15	12	13	12	13	15	14	15	15	14	12	13	14	16	14	16		
JUNE.....	15	17	19	22	24	24	25	25	24	24	23	20	20	20	19	18	18	20	20	22	21	23	21	20	16	14	17	17	20	--		
JULY.....	18	18	18	20	21	22	22	28	23	21	22	24	23	25	25	26	25	24	24	23	22	23	20	21	22	23	22	22	21	22		
AUGUST...	20	20	21	22	23	25	23	25	25	24	21	21	21	20	21	20	20	20	24	25	26	24	20	18	19	19	19	20	18	21		
SEPTEMBER	19	18	22	21	19	18	20	18	18	20	19	18	20	22	21	19	19	18	17	18	18	18	20	17	17	16	14	15	17	--		

SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

(METHODS OF ANALYSIS: B. BOTTOM WITHDRAWAL TUBE; C. CHEMICALLY DISPERSED; N. IN NATIVE WATER; P. PIPET; S. SIEVE; V. VISUAL ACCUMULATION TUBE; W. IN DISTILLED WATER)

DATE	TIME	WATER TEM- PERA- TURE (C)	DISCHARGE (CFS)	CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	SUSPENDED SEDIMENT										METHOD OF ANALY- SIS
						PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00
JUNE 29	1507	19	4310	560	6520	37	40	50	72	72	93	99	100			
JULY 25	1958	23	9770	1710	45100	28	35	42	51	63	83	95	100			
JULY 26	1055	22	13400	1980	71600	38	41	58	62	80	87	95	100			
AUG 8	1000	25	12700	1080	37000	43	50	63	81	92	98	100				

PARTICLE SIZE ANALYSES OF BED MATERIAL, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

(METHODS OF ANALYSIS: H. HYDROMETER; O. OPTICAL ANALYZER; S. SIEVE; V. VISUAL ACCUMULATION TUBE)
BED MATERIAL

DATE	TIME	NO. OF SAMPLING POINTS	DISCHARGE (CFS)	PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED								METHOD OF ANALYSIS		
				0.016	0.031	0.062	0.125	0.25	0.354	0.50	1.000		2.000	4.000
JULY 12	1510	5	1720			6	26	71	86		97	99	100	S
AUG. 8	1900	4	11800			1	4	49	78		96	98	100	S

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Concen- tration (mg/l)	Load (tons per day)
1	264	100	71	322	140	122	292	154	121
2	260	100	70	325	140	123	295	172	137
3	269	100	73	322	140	122	289	179	140
4	256	100	69	325	140	123	313	170	144
5	244	100	66	323	140	122	304	162	133
6	240	100	65	318	140	120	308	163	136
7	264	100	71	311	160	134	328	167	148
8	274	100	74	310	180	151	334	169	152
9	282	100	76	322	140	122	345	162	151
10	269	100	73	327	126	111	350	171	162
11	260	100	70	327	142	125	355	183	175
12	269	100	73	332	152	136	358	160	195
13	271	100	73	330	146	130	361	159	89
14	275	100	74	327	141	124	336	103	66
15	279	100	75	323	151	132	250	115	78
16	278	100	75	329	153	136	270	109	79
17	285	100	77	342	150	138	285	82	63
18	285	100	77	351	149	141	295	70	56
19	362	140	137	345	147	137	290	72	56
20	478	140	181	338	133	121	300	79	64
21	357	140	135	344	122	113	280	81	61
22	303	140	115	342	97	90	220	77	46
23	289	140	109	319	118	102	230	74	46
24	312	140	118	323	146	127	251	76	52
25	302	140	114	338	147	134	250	82	55
26	286	140	108	313	145	123	230	88	55
27	289	140	109	170	109	50	205	95	53
28	286	140	108	269	157	114	190	102	52
29	312	140	118	281	153	116	180	111	54
30	330	140	125	291	175	137	170	122	56
31	325	140	123	--	--	--	160	125	54
Total	9055	--	2902	9539	--	3676	8466	--	2889

05325000 MINNESOTA RIVER AT MANKATO, MINN.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Day	JANUARY			FEBRUARY			MARCH		
	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons per day)	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons per day)
1	150	120	49	133	107	38	136	72	26
2	140	115	43	135	107	39	140	69	26
3	130	119	39	136	107	39	144	63	24
4	120	107	35	138	109	41	150	58	23
5	110	105	31	139	109	41	157	53	22
6	102	103	28	139	110	41	163	48	21
7	96	97	25	140	110	42	180	44	21
8	89	92	22	140	110	42	198	41	22
9	89	85	20	140	110	42	210	41	23
10	88	78	18	139	109	41	225	42	26
11	87	71	17	138	104	39	240	42	27
12	88	62	15	138	99	37	260	40	28
13	91	55	14	137	93	34	300	40	32
14	96	53	14	135	85	31	330	40	36
15	100	54	15	135	77	28	355	38	36
16	103	54	15	134	70	25	405	38	42
17	108	57	17	132	66	24	480	40	52
18	110	62	18	132	77	27	600	48	78
19	112	65	20	131	97	34	700	57	108
20	115	72	22	128	129	44	723	61	119
21	117	77	24	128	124	43	700	47	89
22	118	84	27	128	112	39	696	36	68
23	120	97	30	128	112	39	601	20	32
24	121	97	32	128	109	38	853	32	74
25	125	102	34	129	103	36	1050	51	144
26	125	103	35	129	97	34	1210	111	363
27	127	105	36	130	87	31	1240	113	378
28	129	106	37	130	78	27	1130	97	296
29	130	107	38	131	74	26	1060	62	263
30	131	107	38	--	--	--	1020	114	314
31	132	107	38	--	--	--	1010	142	387
Total	3499	--	846	3879	--	1042	16666	--	3200
	APRIL			MAY			JUNE		
1	948	112	287	1730	162	757	874	124	293
2	843	96	219	1620	142	621	885	141	337
3	801	106	229	1540	165	686	927	137	343
4	811	119	261	1450	184	720	990	112	299
5	759	56	115	1340	162	586	990	98	262
6	822	69	153	1220	134	441	937	100	253
7	874	81	191	1160	123	385	874	101	238
8	811	64	140	1120	136	411	843	91	207
9	790	65	139	1080	102	297	937	113	286
10	769	67	139	1030	83	231	1290	374	1350
11	811	94	206	969	81	212	2380	1040	7030
12	948	124	317	916	95	235	3610	1090	10600
13	1050	130	368	843	96	219	3680	790	7850
14	1090	126	371	822	89	198	3680	626	6240
15	990	114	305	811	111	243	3430	457	4230
16	916	112	277	822	113	251	3060	397	3280
17	948	106	271	759	131	268	2840	368	2800
18	927	96	240	927	132	330	2570	314	2180
19	874	99	234	958	146	378	2340	261	1650
20	1000	100	270	885	141	337	2180	231	1360
21	1040	102	286	822	153	340	2060	225	1250
22	1220	151	497	801	164	355	1900	220	1130
23	1760	309	1470	769	146	303	1790	211	1020
24	1850	294	1470	738	94	187	1760	184	874
25	1970	241	1280	696	91	171	1760	180	855
26	2180	298	1750	738	96	191	1840	176	874
27	2190	244	1440	769	87	181	2590	314	2280
28	2130	178	1020	769	90	187	3670	660	6540
29	2000	191	1030	811	93	204	4260	555	6380
30	1860	167	839	822	117	260	4350	438	5140
31	--	--	--	822	110	244	--	--	--
Total	35982	--	15814	30559	--	10429	65297	--	77451

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MINN.--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

	JULY			AUGUST			SEPTEMBER		
1	4030	322	3500	10800	432	12600	1320	133	474
2	3490	259	2440	9780	418	11000	1240	99	331
3	3000	234	1900	8560	408	9430	1190	91	292
4	2680	203	1470	7220	374	7290	1180	87	277
5	2420	196	1280	5840	336	5300	1210	93	304
6	2210	182	1090	5080	369	5060	1230	102	339
7	2040	153	843	12000	2850	90200	1270	109	374
8	1890	176	898	12300	921	30600	1510	241	1000
9	1760	158	751	11200	569	17200	1960	432	2290
10	1650	161	717	11500	691	21500	2260	306	1870
11	1760	180	855	11400	487	15000	2280	206	1270
12	1730	201	939	9450	433	11000	2160	213	1240
13	1860	270	1360	7640	402	8290	1990	192	1030
14	2270	412	2530	6330	339	5790	1800	164	797
15	2680	645	4670	5380	252	3660	1620	131	573
16	3050	521	4290	4730	260	3320	1540	136	565
17	2930	330	2610	4200	241	2730	1980	232	1240
18	2640	293	2090	3740	206	2080	2720	319	2340
19	2540	274	1850	3310	179	1600	3740	430	4340
20	2450	232	1540	3160	175	1490	4380	397	4690
21	2180	200	1180	2940	157	1250	4920	390	5180
22	1870	172	868	2670	137	988	5860	427	6760
23	2640	555	4550	2430	134	879	7980	543	11700
24	5250	1310	18600	2260	149	909	10200	708	19500
25	8170	1310	28900	2080	127	713	11400	606	18700
26	13000	1800	63200	1890	129	658	10800	478	13900
27	15600	1230	51800	1730	129	603	9170	363	8990
28	15200	837	34400	1570	122	517	7590	270	5530
29	14100	686	26100	1460	110	434	6590	271	4620
30	12500	620	20900	1400	99	374	6110	281	4640
31	11400	508	15600	1350	107	390	--	--	--
Total	151010	--	303751	175400	--	272855	119200		125356
Total Discharge for year (cfs-days)									628552
Total Load for year (tons)									820211

05330000 MINNESOTA RIVER NEAR JORDAN, MINN.
(Formerly published as Minnesota River near Carver, Minn.)

LOCATION.--Lat 44°41'35", long 93°38'30", in NW¼SW¼ sec.7, T.114 N., R.23 W., Carver County, at gaging station on left bank, 1.5 miles northwest of Jordan, and at mile 39.4 upstream from Mississippi River.

DRAINAGE AREA.--16,200 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: December 1962 to August 1966, November 1967 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR NOVEMBER 1967 TO SEPTEMBER 1968

DATE	OIS- CHARGE (CFS)	TEMP- ERATURE (DEG C)	SILICA (SIC2)	TOTAL IRON (FE)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	STRON- TIUM (SR)	SODIUM (NA)	PO- TAS- SIUM (K)	LITHIUM (LI)	BICAR- BONATE (HCC3)	CAR- BONATE (CC3)
NOV. 15...	441	4	14	.00	98	43	--	48	5.5	--	388	0
DEC. 12...	467	0	12	.02	105	45	.44	50	5.6	.00	398	0
JAN. 16...	183	1	19	.01	90	48	--	63	6.2	--	356	9
FEB. 21...	206	0	21	.04	123	50	--	60	6.8	--	454	19
MAR. 20...	963	4	16	.03	83	36	--	36	6.4	--	291	12
APR. 18...	922	14	8.4	.03	86	42	.45	34	6.2	.00	270	5
MAY 14...	1070	16	8.4	.05	83	45	--	33	6.5	--	272	0
JUNE 20...	3190	16	23	.06	84	29	--	16	4.5	--	248	0
JULY 31...	14900	22	22	.02	61	20	--	7.2	4.8	--	192	0
SEPT. 03...	1780	24	27	.00	89	34	--	21	5.6	--	324	0
DATE	TOTAL CHRO- MIUM (CR)	NICKEL (NI)	COBALT (CO)	LEAD (PB)	DI-SOLVED SOLIDS (SUM OF CONSTITUENTS)	OIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)					
NOV. 15...	--	--	--	--	590	.84	733					
DEC. 12...	.00	.00	.00	.01	620	.87	806					
JAN. 16...	--	--	--	--	638	.89	324					
FEB. 21...	--	--	--	--	736	1.05	429					
MAR. 20...	--	--	--	--	513	.74	1410					
APR. 18...	.00	.00	.00	.00	545	.79	1450					
MAY 14...	--	--	--	--	537	.78	1650					
JUNE 20...	--	--	--	--	430	.63	4010					
JULY 31...	--	--	--	--	304	.47	14000					
SEPT. 03...	--	--	--	--	470	.66	2350					

05330000 MINNESOTA RIVER NEAR JORDAN, MINN.--Continued

DATE	CHEMICAL ANALYSES IN MILLIGRAMS PER LITER,						WATER YEAR NOVEMBER 1967 TO SEPTEMBER 1968				
	ALKA-LINITY AS CACCO3	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	ORTHOPHOSPHATE (PO4)	TOTAL ALUMINIUM (AL)	BORON (B)	COPPER (CU)	ZINC (ZK)	CADMIUM (CC)
NOV. 15...	318	156	34	.3	.2	.38	.3	.14	--	--	--
DEC. 12...	326	169	34	.2	.9	.46	.1	.15	.00	.00	.00
JAN. 16...	307	168	52	.2	5.1	.64	.3	.17	--	--	--
FEB. 21...	404	179	46	.3	5.8	.46	.3	.18	--	--	--
MAR. 20...	258	153	25	.3	1.7	.84	.2	.13	--	--	--
APR. 18...	230	208	20	.3	.1	.54	.0	.14	.00	.00	.00
MAY 14...	223	205	21	.3	.9	.60	.7	.12	--	--	--
JUNE 20...	203	108	14	.4	28	.59	.7	.07	--	--	--
JULY 31...	157	64	6.2	.3	20	.56	.6	.06	--	--	--
SEPT. 03...	266	109	19	.4	5.1	.65	.7	.10	--	--	--

DATE	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SODIUM PERCENT	SPECIAL CONDUCANCE (MICRO-SIEMENS)	PH	COLOR		
								NOV. 15...	DEC. 12...	JAN. 16...	FEB. 21...	MAR. 20...	APR. 18...	MAY 14...	JUNE 20...	JULY 31...	SEPT. 03...
NOV. 15...	420	102	1.0	20	923	7.9	7		
DEC. 12...	446	120	1.0	19	966	7.7	7		
JAN. 16...	423	116	1.3	24	997	8.4	4		
FEB. 21...	510	106	1.2	20	1140	8.5	6		
MAR. 20...	352	63	.8	18	796	8.5	12		
APR. 18...	389	159	.7	16	846	8.3	4		
MAY 14...	389	166	.7	15	838	7.8	9		
JUNE 20...	329	126	.4	9	667	8.1	28		
JULY 31...	232	75	.2	6	481	7.6	20		
SEPT. 03...	360	94	.5	11	723	8.0	15		

05331000 MISSISSIPPI RIVER MAIN STEM

MISSISSIPPI RIVER AT ST. PAUL, MINN.

LOCATION.--Lat 44°56'40", long 93°05'20", in SE1/4 sec. 6, T.28 N., R.22 W., Ramsey County, temperature recorder at gaging station, on left bank in St. Paul, 300 ft upstream from Robert Street Bridge, 6 miles downstream from Minnesota River, and at mile 839.3 upstream from Ohio River.

DRAINAGE AREA.--36,800 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: October 1956 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 28.0°C July 18-20, Aug. 7-9; minimum, freezing point on many days during November to February.

Period of record:

Water temperatures: Maximum, 31.0°C July 24-28, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--Recorder stopped Feb. 10-13 and May 17-22.

Month	TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968																															Average		
	(CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)																																	
	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			
October	16	17	17	17	19	18	18	17	16	15	14	14	13	13	13	13	13	13	13	13	12	13	13	12	12	12	11	11	11	11	14			
Minimum	16	16	17	17	17	17	17	16	15	13	12	12	11	12	12	12	12	12	12	12	12	11	11	12	12	11	11	9	8	7	8	13		
November	10	10	9	9	9	7	8	8	7	8	8	8	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	7			
Maximum	7	7	7	7	6	6	4	3	4	4	6	6	6	6	4	4	4	4	4	4	3	3	2	2	2	2	2	1	1	0	0	4		
Minimum	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	6	5	4	4	4	5	5	5	5	5		
December	0	1	2	1	0	1	2	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1		
January	5	5	6	6	6	6	5	4	3	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Maximum	4	0	0	3	4	3	0	0	0	0	3	0	1	1	0	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Minimum	6	5	6	5	5	4	4	4	3	--	--	--	3	3	2	2	1	1	1	3	4	4	4	4	5	5	5	5	5	--	--	4		
February	1	2	2	2	3	1	0	0	--	--	--	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	2	2	2	2	2		
Maximum	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Minimum	2	2	2	3	4	3	3	4	3	4	3	2	1	2	2	3	4	3	4	6	3	3	2	3	2	4	4	6	6	8	7	9	4	
March	9	10	9	9	8	8	8	8	8	9	10	12	11	11	10	11	12	12	13	12	11	13	13	11	9	10	11	11	12	14	--	11		
Maximum	9	9	9	8	8	8	8	8	8	8	9	10	11	10	10	10	10	10	10	11	11	11	11	11	9	9	10	10	11	12	--	10		
Minimum	14	16	16	16	15	14	14	13	13	13	14	14	16	17	18	17	--	--	--	--	--	--	--	--	17	17	16	16	15	15	16	17	15	
April	12	13	14	13	13	13	12	12	12	12	13	14	14	16	--	--	--	--	--	--	--	--	--	--	15	15	15	14	14	14	15	16	14	
Maximum	18	18	20	22	23	24	26	26	26	25	24	23	22	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	22	
Minimum	16	17	18	18	21	21	22	24	23	22	22	22	22	22	21	21	21	20	20	20	20	21	21	21	21	21	21	21	21	21	20	20	20	
May	20	19	20	21	22	22	23	25	25	25	25	26	26	26	26	27	28	28	28	28	27	27	27	26	26	26	26	25	24	24	24	25		
Maximum	19	19	19	19	21	19	21	22	22	22	23	23	25	25	24	25	26	26	27	26	24	24	24	25	25	24	24	24	24	23	23	21	21	
Minimum	23	24	24	25	26	27	28	28	28	24	24	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	24
June	23	23	23	23	24	24	25	25	24	24	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Maximum	18	18	20	22	23	24	26	26	26	25	24	23	22	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	22	
Minimum	16	17	18	18	21	21	22	24	23	22	22	22	22	22	21	21	21	20	20	20	20	21	21	21	21	21	21	21	21	21	20	20	20	
July	20	19	20	21	22	22	23	25	25	25	25	26	26	26	26	27	28	28	28	28	27	27	27	26	26	26	26	25	24	24	24	25		
Maximum	19	19	19	19	21	19	21	22	22	22	23	23	25	25	24	25	26	26	27	26	24	24	24	25	25	24	24	24	24	23	23	21	21	
Minimum	23	24	24	25	26	27	28	28	28	24	24	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	24	
August	23	23	23	23	24	24	25	25	24	24	23	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	24
Maximum	21	21	21	21	21	21	21	20	19	19	19	19	20	21	20	20	19	19	19	19	19	19	19	19	19	19	19	18	17	17	17	17	20	
Minimum	21	21	21	21	21	20	20	19	19	19	19	19	19	19	19	20	21	20	19	19	19	19	19	19	19	19	19	18	17	17	17	--	19	

WHITEWATER RIVER BASIN
05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MINN.
(Hydrologic bench-mark station)

LOCATION.--Lat 44°05'30", long 92°03'57", in sec.7, T.107 N., R.10 W., Winona County, at gaging station on left bank, 2.3 miles upstream from Middle Fork, 2.4 miles west of Elba, and 3.5 miles upstream from confluence with South Fork.

DRAINAGE AREA.--101 sq mi.

PERIOD OF RECORD.--Chemical analyses: August 1967 to September 1968,
CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR

DATE	DIS-CHARGE (CFS)	TEMPERATURE (DEG C)	SILICA (SI02)	TOTAL IRON (FE)	CALCIUM (CA)	MAG-NE-SIUM (MG)	STRON-TIUM (SR)	SODIUM (NA)	PO-TAS-SIUM (K)	LITHIUM (LI)	BICAR-BONATE (HCC3)	CAR-BONATE (CC3)
OCT. 25...	14	7	15	.10	38	24	.00	2.6	3.0	.00	222	0
NOV. 30...	14	3	16	.02	66	25	--	2.9	1.5	--	318	0
DEC. 20...	14	4	10	.00	63	24	--	3.6	1.3	--	258	6
JAN. 24...	13	2	16	.00	63	24	--	3.3	2.1	--	313	0
FEB. 28...	13	2	15	.00	48	22	--	2.6	1.2	--	254	0
MAR. 21...	13	4	13	.04	62	23	.16	3.1	1.4	.00	291	0
MAY 06...	13	11	12	.03	51	24	--	2.8	1.0	--	266	0
23...	16	10	16	.03	63	25	--	3.0	1.2	--	308	0
JUNE 24...	22	14	15	.05	58	19	--	3.1	2.1	--	260	0
AUG. 15...	14	14	16	.02	66	24	--	3.7	2.4	--	312	0
SEPT. 09...	68	14	10	.16	37	11	--	1.9	5.0	--	166	0

DATE	CADMIUM (CO)	TOTAL CHROMIUM (CR)	NICKEL (NI)	COBALT (CO)	LEAD (PB)	DISSOLVED OXYGEN	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	DISSOLVED SOLIDS (TONS PER AC-FT)	FIS-SOLVED SOLIDS (TCAS PER CAY)
OCT. 25...	.00	.00	.00	.00	.01	--	210	.29	8.40
NOV. 30...	--	--	--	--	--	--	289	.39	10.5
DEC. 20...	--	--	--	--	--	--	272	.37	10.2
JAN. 24...	--	--	--	--	--	13.0	282	.40	10.8
FEB. 28...	--	--	--	--	--	12.7	232	.32	8.50
MAR. 21...	.00	.00	.00	.00	.00	13.2	264	.36	9.48
MAY 06...	--	--	--	--	--	14.0	239	.32	8.45
23...	--	--	--	--	--	11.5	279	.37	11.5
JUNE 24...	--	--	--	--	--	8.9	250	.35	15.6
AUG. 15...	--	--	--	--	--	12.3	287	.39	11.4
SEPT. 09...	--	--	--	--	--	8.2	165	.24	31.5

DATE	ALKALINITY AS CaCO3	SULFATE (SO4)	CHLORIDE (CL)	FLUORIDE (F)	NITRATE (NO3)	ORTHO PHOSPHATE (PO4)	PHOSPHATE (PO4)	TOTAL ALUMINIUM (AL)	BORON (B)	CCPBR (CL)	ZINC (ZK)
OCT. 25...	182	12	1.7	.1	4.4	.16	.26	.1	.01	.60	.00
NOV. 30...	261	13	1.8	.0	5.9	.11	.17	.4	.00	--	--
DEC. 20...	254	12	2.2	.0	3.3	.13	.38	.1	.00	--	--
JAN. 24...	257	12	1.5	.1	5.1	.18	.31	.4	.00	--	--
FEB. 28...	208	11	1.3	.1	5.8	.13	.23	.2	.01	--	--
MAR. 21...	239	13	2.5	.1	3.6	.18	.22	.1	.00	.00	.00
MAY 06...	218	12	1.7	.2	2.2	.07	.52	.0	.00	--	--
23...	253	13	2.0	.2	4.0	.12	.22	.5	.00	--	--
JUNE 24...	213	13	2.3	.2	8.5	.56	.71	.6	.00	--	--
AUG. 15...	256	12	2.6	.2	5.1	.23	.34	1.8	.00	--	--
SEPT. 09...	136	8.3	4.6	.1	4.4	1.2	1.2	.5	.03	--	--

DATE	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	PERCENT SODIUM	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	COLOR	COLIFORM BACTERIA PER 100 ML	BIOCHEMICAL OXYGEN DEMAND
OCT. 25...	192	10	.1	3	377	7.7	2	--	.6
NOV. 30...	269	8	.1	2	492	8.0	2	--	.6
DEC. 20...	257	3	.1	3	467	8.4	3	--	2.6
JAN. 24...	257	0	.1	3	483	8.0	1	--	.4
FEB. 28...	211	3	.1	3	399	8.0	2	--	.4
MAR. 21...	247	8	.1	3	600	7.7	3	16	.8
MAY 06...	228	10	.1	3	419	8.2	2	30	1.5
23...	258	5	.1	2	485	8.2	3	14	1.1
JUNE 24...	223	10	.1	3	438	8.0	80	200	1.2
AUG. 15...	264	9	.1	3	491	7.4	5	--	.3
SEPT. 09...	139	3	.1	3	289	7.3	6	--	1.7

WHITEWATER RIVER BASIN

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05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MINN.--Continued

RADIOCHEMICAL ANALYSES, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Units of measurement: Uranium, micrograms per liter of water; radium as radium-226, in picocuries per liter of water; gross beta radiation as strontium-90-yttrium-90, in picocuries per liter of water; gross alpha radiation, as micrograms of uranium equivalent per liter of water.

Date of Collection	Dissolved					Suspended		
	Uranium (ug/l)	Radium (pc/l)	Gross β (pc/l)	Gross α (ug U/l)	Total Dissolved Solids (mg/l)	Gross β (pc/l)	Gross α (ug U/l)	Suspended Sediments (mg/l)
Oct. 25, 1967..	0.5	<0.1	3.4	5.4	253	1.2	0.8	1
May 6, 1968..	.5	.2	3.1	2.0	256	.9	<4	4

PESTICIDE ANALYSES, IN MICROGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ALDRIN	DDD	DDE	DDT	DIELDRIN	ENDRIN	HEPTACHLOR	LINDANE	2,4-D	2,4,5-T
OCT. 25....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
May 6....	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DETERMINATIONS OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)	Date	Mean Discharge (cfs)	Mean Concentration (mg/l)	Load (tons)
Oct. 25, 1967	15	84	3.4	May 22, 1968	16	23	1.0
Nov. 30	14	113	4.3	June 24	22	415	25
Mar. 21, 1968	13	9	.3	Aug. 15	15	57	2.3
Apr. 25	18	12	.6	Sept. 9	68	773	142

UPPER IOWA RIVER BASIN

05387500 UPPER IOWA RIVER AT DECORAH, IOWA

LOCATION (revised).--Lat 43°18'20"N, long 91°48'05"W, in NE¼SW¼ sec.16, T.98 N., R.8 W., Winneshiek County, at gaging station at Decorah, on right bank 1,200 ft upstream from bridge on U.S. Highway 52, 1,500 ft downstream from Dry Run cutoff, and 3.0 miles upstream from Trout Run.

DRAINAGE AREA.--511 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1962 to September 1964, October 1965 to September 1968. Sediment records: October 1962 to December 1967 (discontinued).

EXTREMES.--1967-68:

Water temperatures: Maximum, 32.0°C Aug. 23; minimum, freezing point on many days during December to March.

Period of record:

Water temperatures: Maximum, 32.0°C Aug. 23, 1968; minimum, freezing point on many days during winter periods. Sediment concentrations: Maximum daily, 8,700 mg/l May 26, 1965; minimum daily, 1 mg/l Oct. 21, 1965. Sediment loads: Maximum daily, 62,300 tons June 10, 1967; minimum daily, 1 ton Oct. 21, 1965.

REMARKS.--No appreciable inflow between sampling point and gaging station. Temperature recorder installed on April 12, 1967, at stream gaging station.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	17.0	11.0	8.0	7.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
2	19.0	14.0	7.0	6.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
3	19.0	16.0	6.0	4.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
4	19.0	17.0	4.0	2.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
5	17.0	14.0	2.0	2.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
6	16.0	13.0	3.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0
7	14.0	12.0	3.0	1.0	2.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0
8	12.0	10.0	4.0	1.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
9	10.0	8.0	4.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0
10	8.0	7.0	6.0	4.0	2.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0
11	9.0	7.0	8.0	4.0	2.0	1.0	0.0	0.0	0.0	0.0	3.0	1.0
12	11.0	6.0	6.0	4.0	2.0	1.0	0.0	0.0	0.0	0.0	3.0	1.0
13	14.0	10.0	4.0	4.0	1.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0
14	13.0	10.0	4.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.0
15	12.0	11.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	2.0
16	13.0	9.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	3.0
17	12.0	8.0	4.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	4.0
18	10.0	7.0	3.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0	7.0	6.0
19	10.0	6.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	9.0	6.0
20	9.0	6.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	7.0	4.0
21	9.0	5.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	6.0	2.0
22	12.0	6.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.0
23	13.0	10.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	1.0
24	12.0	8.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	2.0
25	8.0	5.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	6.0
26	6.0	4.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	7.0
27	5.0	4.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	4.0
28	5.0	3.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	8.0
29	5.0	4.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	9.0
30	5.0	4.0	1.0	1.0	0.0	0.0	0.0	0.0	--	--	16.0	9.0
31	8.0	4.0	--	--	0.0	0.0	0.0	0.0	--	--	14.0	10.0
AVERAGE	12.0	8.0	3.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	8.0	3.0

UPPER IOWA RIVER BASIN

05387500 UPPER IOWA RIVER AT DECORAH, IOWA.--Continued

TEMPERATURE(°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.0	7.0	21.0	14.0	20.0	15.0	20.0	16.0	23.0	18.0	22.0	17.0
2	11.0	7.0	22.0	14.0	22.0	16.0	19.0	16.0	25.0	19.0	22.0	16.0
3	10.0	9.0	20.0	16.0	23.0	17.0	21.0	16.0	24.0	21.0	24.0	18.0
4	9.0	5.0	16.0	12.0	27.0	19.0	23.0	18.0	24.0	21.0	22.0	18.0
5	10.0	3.0	17.0	9.0	28.0	22.0	23.0	19.0	28.0	20.0	18.0	16.0
6	11.0	5.0	14.0	11.0	28.0	22.0	19.0	13.0	31.0	24.0	18.0	14.0
7	10.0	7.0	12.0	11.0	28.0	22.0	19.0	14.0	29.0	24.0	18.0	14.0
8	9.0	6.0	16.0	10.0	29.0	23.0	25.0	15.0	28.0	24.0	17.0	14.0
9	12.0	6.0	14.0	12.0	29.0	20.0	26.0	21.0	28.0	24.0	17.0	14.0
10	14.0	7.0	17.0	11.0	26.0	19.0	26.0	20.0	24.0	21.0	18.0	13.0
11	17.0	9.0	17.0	12.0	22.0	20.0	27.0	20.0	24.0	19.0	20.0	13.0
12	18.0	12.0	20.0	12.0	23.0	18.0	24.0	21.0	24.0	20.0	21.0	15.0
13	16.0	14.0	20.0	13.0	22.0	18.0	28.0	22.0	27.0	19.0	21.0	16.0
14	15.0	8.0	22.0	17.0	24.0	19.0	28.0	24.0	25.0	21.0	22.0	17.0
15	14.0	8.0	23.0	17.0	22.0	18.0	28.0	24.0	22.0	19.0	22.0	17.0
16	13.0	10.0	18.0	13.0	22.0	17.0	28.0	24.0	26.0	19.0	19.0	12.0
17	16.0	11.0	13.0	11.0	22.0	17.0	26.0	23.0	26.0	20.0	13.0	12.0
18	17.0	12.0	13.0	12.0	22.0	19.0	29.0	23.0	22.0	20.0	18.0	16.0
19	16.0	13.0	15.0	11.0	23.0	18.0	29.0	23.0	27.0	20.0	17.0	18.0
20	15.0	12.0	15.0	12.0	24.0	19.0	26.0	22.0	29.0	22.0	19.0	15.0
21	18.0	12.0	18.0	13.0	27.0	21.0	28.0	22.0	31.0	24.0	21.0	15.0
22	18.0	14.0	17.0	14.0	28.0	21.0	28.0	22.0	31.0	25.0	20.0	18.0
23	13.0	9.0	18.0	13.0	27.0	21.0	24.0	19.0	32.0	26.0	19.0	18.0
24	9.0	6.0	16.0	14.0	21.0	19.0	23.0	19.0	28.0	22.0	19.0	17.0
25	11.0	5.0	14.0	13.0	21.0	17.0	24.0	20.0	24.0	18.0	17.0	14.0
26	13.0	8.0	13.0	12.0	17.0	14.0	24.0	21.0	23.0	18.0	17.0	13.0
27	14.0	10.0	12.0	11.0	14.0	13.0	26.0	22.0	23.0	17.0	17.0	13.0
28	14.0	12.0	15.0	11.0	16.0	12.0	24.0	22.0	22.0	17.0	14.0	13.0
29	17.0	11.0	14.0	13.0	17.0	14.0	23.0	19.0	23.0	17.0	17.0	12.0
30	19.0	12.0	17.0	13.0	19.0	17.0	25.0	20.0	22.0	18.0	18.0	13.0
31	19.0	--	16.0	14.0	--	--	23.0	21.0	21.0	18.0	--	--
AVERAGE	14.0	9.0	17.0	13.0	23.0	18.0	25.0	20.0	28.0	20.0	19.0	15.0

SUSPENDED-SEDIMENT, OCTOBER TO DECEMBER 1967

(WHERE NO DAILY CONCENTRATIONS ARE REPORTED, LOADS ARE ESTIMATED)

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY
1	57	53	8.2	84	29	5.0	50	12	1.6
2	57	75	12	83	26	4.4	50	10	1.4
3	57	10	1.5	82	21	3.5	48	9	1.2
4	58	8	1.3	60	40	6.5	47	6	.8
5	59	9	1.4	59	19	3.0	49	7	.9
6	56	23	3.5	58	50	7.8	53	7	1.0
7	70	9	1.7	57	14	2.2	57	18	2.8
8	73	13	2.6	57	24	3.7	59	27	4.3
9	89	2	.4	58	9	1.4	61	5	.8
10	68	14	2.6	59	12	1.9	60	7	1.1
11	67	20	3.6	58	31	4.9	59	9	1.4
12	88	39	6.9	58	37	5.8	58	--	--
13	87	87	12	57	22	3.4	46	--	1.0
14	84	49	8.5	57	31	4.8	37	4	.4
15	62	30	5.0	56	41	6.2	33	--	.9
16	61	43	7.1	56	13	2.0	45	--	1.2
17	80	37	6.0	57	23	3.5	52	--	1.4
18	59	23	3.7	58	48	7.3	56	--	1.5
19	57	16	2.5	55	18	2.7	46	--	1.2
20	57	15	2.3	56	23	3.5	42	--	1.1
21	57	17	2.6	55	18	2.7	39	--	1.1
22	58	28	4.2	66	12	2.1	78	--	2.1
23	57	45	6.9	54	17	2.5	55	--	1.5
24	61	41	6.8	53	14	2.0	52	--	1.4
25	61	29	4.8	54	10	1.5	51	--	1.4
26	59	16	2.5	52	10	1.4	48	--	1.3
27	59	61	9.7	41	30	3.3	45	--	1.2
28	58	20	3.1	37	19	1.9	49	--	1.1
29	59	18	2.9	46	22	2.7	40	--	1.1
30	64	24	4.1	51	14	1.9	38	--	1.0
31	62	20	3.3	--	--	--	36	--	1.0
TOTAL	1897	--	143.7	1672	--	105.5	1530	--	41.6

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	WATER TEMPERATURE (C)	DIS-CHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	WATER TEMPERATURE (C)	DIS-CHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JAN. 16	1325	0	41	21	2.3	JUNE 3	1610	23	180	34	17
FEB. 14	0840	0	45	5	.6	JULY 8	1600	24	218	36	21
MAR. 11	1800	2	127	5	1.7	AUG. 3	0730	19	143	68	26
APR. 8	1730	9	59	19	3.0	SEP. 9	1610	16	114	19	5.8
MAY 13	1600	20	70	41	7.7						

05401020 TENMILE CREEK DITCH 5, NEAR BANCROFT, WIS.

LOCATION.--Lat 44°18'08", long 89°32'59", in NE¼ sec.16, T.21 N., R.8 E., temperature recorder at gaging station at bridge on county road, 1.2 miles west of U.S. Highway 51, and 1.8 miles southwest of Bancroft.

DRAINAGE AREA.--8.8 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: June 1965 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 19.0°C Aug. 22, 23; minimum, 1.0°C Jan. 4-12, Jan. 25, 26, Feb. 20, 21.

Period of record:

Water temperatures: Maximum, 22.0° July 10, 1966; minimum, freezing point on many days during winter periods in 1965-67.

DAY	TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968													
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH			
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN		
1	12.0	9.0	8.0	8.0	4.0	4.0	2.0	2.0	4.0	4.0	3.0	2.0		
2	12.0	11.0	8.0	7.0	6.0	4.0	2.0	2.0	4.0	2.0	3.0	2.0		
3	12.0	12.0	7.0	6.0	6.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0		
4	14.0	11.0	6.0	5.0	4.0	4.0	2.0	1.0	4.0	2.0	4.0	2.0		
5	13.0	10.0	5.0	4.0	6.0	4.0	1.0	1.0	4.0	3.0	2.0	2.0		
6	11.0	9.0	8.0	7.0	6.0	6.0	1.0	1.0	4.0	2.0	3.0	2.0		
7	9.0	8.0	8.0	7.0	6.0	4.0	1.0	1.0	3.0	2.0	5.0	3.0		
8	9.0	9.0	8.0	6.0	6.0	6.0	1.0	1.0	3.0	2.0	6.0	4.0		
9	9.0	8.0	9.0	8.0	7.0	5.0	1.0	1.0	2.0	2.0	5.0	5.0		
10	8.0	7.0	9.0	6.0	6.0	5.0	1.0	1.0	2.0	2.0	5.0	4.0		
11	8.0	7.0	9.0	8.0	6.0	6.0	2.0	1.0	2.0	2.0	5.0	4.0		
12	8.0	6.0	9.0	6.0	6.0	6.0	2.0	1.0	2.0	2.0	4.0	3.0		
13	10.0	8.0	9.0	5.0	6.0	4.0	2.0	2.0	2.0	2.0	4.0	2.0		
14	10.0	8.0	5.0	4.0	4.0	3.0	2.0	2.0	2.0	2.0	4.0	3.0		
15	9.0	9.0	4.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	6.0	4.0		
16	10.0	8.0	6.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	7.0	5.0		
17	9.0	8.0	6.0	6.0	5.0	3.0	3.0	2.0	2.0	2.0	7.0	5.0		
18	9.0	7.0	6.0	5.0	4.0	2.0	4.0	3.0	2.0	2.0	7.0	7.0		
19	8.0	6.0	5.0	4.0	3.0	2.0	4.0	3.0	2.0	2.0	9.0	7.0		
20	7.0	7.0	5.0	4.0	5.0	3.0	4.0	3.0	2.0	1.0	8.0	4.0		
21	7.0	6.0	6.0	5.0	6.0	2.0	4.0	3.0	2.0	1.0	4.0	3.0		
22	9.0	6.0	6.0	4.0	2.0	2.0	4.0	4.0	2.0	2.0	4.0	3.0		
23	12.0	9.0	5.0	5.0	2.0	2.0	4.0	2.0	2.0	2.0	5.0	2.0		
24	12.0	8.0	6.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	8.0	3.0		
25	8.0	7.0	6.0	6.0	2.0	2.0	2.0	1.0	2.0	2.0	9.0	6.0		
26	7.0	6.0	6.0	4.0	2.0	2.0	3.0	1.0	3.0	2.0	9.0	6.0		
27	7.0	6.0	4.0	3.0	2.0	2.0	3.0	3.0	2.0	2.0	10.0	8.0		
28	7.0	5.0	3.0	3.0	2.0	2.0	4.0	3.0	3.0	2.0	11.0	7.0		
29	7.0	6.0	3.0	3.0	2.0	2.0	4.0	3.0	2.0	2.0	10.0	7.0		
30	8.0	7.0	4.0	3.0	2.0	2.0	3.0	2.0	---	---	10.0	6.0		
31	8.0	7.0	---	---	2.0	2.0	4.0	3.0	---	---	10.0	7.0		
MONTH	14.0	5.0	9.0	3.0	7.0	2.0	4.0	1.0	4.0	1.0	11.0	2.0		

DAY	TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968											
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	8.0	4.0	14.0	7.0	15.0	11.0	14.0	11.0	14.0	11.0	13.0	12.0
2	9.0	5.0	14.0	8.0	16.0	11.0	13.0	11.0	15.0	11.0	13.0	11.0
3	8.0	6.0	13.0	9.0	16.0	11.0	14.0	9.0	16.0	13.0	15.0	11.0
4	7.0	4.0	10.0	8.0	17.0	12.0	13.0	11.0	16.0	13.0	14.0	13.0
5	8.0	2.0	12.0	6.0	18.0	13.0	14.0	11.0	17.0	14.0	13.0	11.0
6	9.0	5.0	11.0	7.0	18.0	13.0	16.0	11.0	16.0	14.0	12.0	11.0
7	8.0	7.0	12.0	7.0	18.0	14.0	14.0	12.0	17.0	13.0	11.0	11.0
8	8.0	7.0	13.0	9.0	18.0	14.0	17.0	12.0	16.0	13.0	13.0	11.0
9	10.0	6.0	12.0	9.0	19.0	14.0	16.0	13.0	15.0	13.0	13.0	12.0
10	9.0	6.0	14.0	8.0	18.0	14.0	14.0	11.0	14.0	12.0	12.0	11.0
11	11.0	6.0	13.0	9.0	17.0	14.0	16.0	11.0	14.0	10.0	14.0	9.0
12	13.0	9.0	14.0	11.0	16.0	12.0	14.0	12.0	14.0	11.0	12.0	10.0
13	12.0	10.0	16.0	9.0	14.0	9.0	17.0	12.0	16.0	12.0	13.0	11.0
14	8.0	6.0	15.0	12.0	16.0	12.0	16.0	14.0	14.0	12.0	13.0	11.0
15	11.0	4.0	17.0	11.0	14.0	11.0	18.0	13.0	13.0	11.0	13.0	11.0
16	11.0	7.0	16.0	9.0	14.0	11.0	18.0	14.0	17.0	13.0	13.0	12.0
17	10.0	9.0	12.0	8.0	16.0	11.0	17.0	15.0	16.0	13.0	13.0	12.0
18	11.0	8.0	11.0	9.0	14.0	12.0	17.0	14.0	14.0	12.0	12.0	12.0
19	11.0	8.0	12.0	8.0	16.0	11.0	14.0	12.0	17.0	13.0	12.0	11.0
20	9.0	8.0	11.0	9.0	14.0	11.0	14.0	11.0	17.0	13.0	12.0	11.0
21	12.0	8.0	12.0	8.0	16.0	12.0	17.0	12.0	18.0	14.0	13.0	10.0
22	12.0	8.0	17.0	9.0	17.0	12.0	15.0	12.0	19.0	16.0	13.0	12.0
23	11.0	9.0	12.0	9.0	16.0	12.0	14.0	11.0	19.0	16.0	13.0	12.0
24	8.0	5.0	13.0	9.0	14.0	13.0	14.0	11.0	18.0	14.0	13.0	12.0
25	8.0	4.0	12.0	9.0	13.0	11.0	14.0	11.0	14.0	12.0	12.0	9.0
26	12.0	6.0	10.0	9.0	11.0	11.0	13.0	11.0	13.0	11.0	12.0	10.0
27	12.0	7.0	9.0	9.0	11.0	10.0	16.0	12.0	13.0	9.0	11.0	9.0
28	10.0	7.0	9.0	9.0	10.0	9.0	14.0	11.0	14.0	10.0	11.0	9.0
29	12.0	7.0	9.0	9.0	13.0	9.0	14.0	10.0	14.0	11.0	11.0	9.0
30	12.0	7.0	12.0	9.0	14.0	11.0	16.0	12.0	14.0	11.0	12.0	9.0
31	---	---	13.0	9.0	---	---	15.0	14.0	13.0	12.0	---	---
MONTH	13.0	2.0	17.0	6.0	18.0	9.0	18.0	9.0	19.0	9.0	15.0	9.0

WAPSIPINICON RIVER BASIN

225

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IOWA

LOCATION.--Lat 42°27'50", long 91°53'40", in SE 1/4 sec. 4, T. 88 N., R. 9 W., Buchanan County, 100 ft downstream from dam at abandoned hydroelectric plant, 3.5 miles downstream from Otter Creek, 10.5 miles upstream from Pine Creek and 0.4 mile above gaging station.

DRAINAGE AREA.--1048 sq mi.

PERIOD OF RECORD.--Water temperatures: December 1967 to September 1968.
Sediment records: December 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 32.0°C June 23; minimum, 1.0°C Feb. 8, 9, 10, 13.
Sediment concentrations: Maximum daily, 840 mg/l July 17; minimum daily 3 mg/l Dec. 25, Jan. 28.
Sediment loads.--Maximum daily, 31,100 tons July 17; minimum daily, 0.4 tons Jan. 21, 28.

REMARKS.--Maximum observed concentration during period, 1,480 mg/l July 17.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	UCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	3.0	2.0	2.0	4.0	14.0	13.0	21.0	21.0	26.0	24.0
2	---	---	3.0	2.0	2.0	4.0	13.0	19.0	22.0	21.0	26.0	24.0
3	---	---	3.0	2.0	2.0	4.0	11.0	13.0	24.0	22.0	21.0	24.0
4	---	---	3.0	2.0	2.0	6.0	9.0	17.0	24.0	21.0	24.0	24.0
5	---	---	4.0	2.0	2.0	4.0	9.0	16.0	24.0	23.0	26.0	24.0
6	---	---	4.0	2.0	1.0	4.0	9.0	16.0	26.0	24.0	26.0	24.0
7	---	---	4.0	2.0	2.0	6.0	10.0	14.0	27.0	24.0	26.0	24.0
8	---	---	4.0	2.0	2.0	6.0	10.0	15.0	27.0	24.0	26.0	24.0
9	10.0	---	4.0	2.0	1.0	6.0	11.0	16.0	27.0	26.0	27.0	19.0
10	---	---	4.0	2.0	1.0	3.0	13.0	15.0	26.0	26.0	26.0	21.0
11	---	---	4.0	2.0	2.0	3.0	14.0	16.0	26.0	26.0	26.0	21.0
12	---	---	4.0	2.0	2.0	4.0	16.0	---	26.0	26.0	21.0	21.0
13	---	5.0	3.0	2.0	1.0	4.0	16.0	19.0	26.0	26.0	22.0	22.0
14	---	---	4.0	3.0	3.0	6.0	16.0	19.0	26.0	26.0	26.0	21.0
15	---	---	4.0	2.0	3.0	6.0	14.0	20.0	26.0	27.0	26.0	22.0
16	---	---	4.0	2.0	3.0	8.0	14.0	19.0	27.0	27.0	26.0	22.0
17	---	---	4.0	3.0	3.0	12.0	17.0	16.0	27.0	23.0	20.0	21.0
18	---	---	4.0	3.0	4.0	6.0	17.0	15.0	24.0	25.0	26.0	20.0
19	---	---	4.0	3.0	4.0	6.0	16.0	15.0	24.0	25.0	24.0	20.0
20	---	---	4.0	3.0	4.0	6.0	17.0	16.0	26.0	26.0	27.0	19.0
21	---	---	3.0	3.0	3.0	4.0	17.0	16.0	27.0	26.0	27.0	19.0
22	---	---	3.0	3.0	4.0	6.0	17.0	16.0	28.0	26.0	28.0	20.0
23	---	---	3.0	3.0	4.0	3.0	15.0	15.0	32.0	26.0	28.0	21.0
24	---	---	2.0	2.0	6.0	6.0	10.0	16.0	24.0	24.0	27.0	21.0
25	---	---	3.0	3.0	6.0	8.0	10.0	16.0	23.0	26.0	27.0	21.0
26	---	---	2.0	3.0	3.0	11.0	14.0	16.0	18.0	25.0	27.0	20.0
27	---	---	3.0	3.0	4.0	11.0	16.0	16.0	15.0	27.0	26.0	19.0
28	---	---	3.0	3.0	4.0	11.0	16.0	16.0	17.0	27.0	24.0	16.0
29	---	---	3.0	2.0	3.0	14.0	17.0	17.0	18.0	26.0	26.0	17.0
30	---	4.0	3.0	2.0	---	14.0	18.0	19.0	21.0	26.0	24.0	18.0
31	---	---	2.0	2.0	---	14.0	---	18.0	---	26.0	23.0	---
AVERAGE	---	---	3.5	2.5	3.0	7.0	14.0	16.5	24.5	25.0	25.5	21.0

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; D, DECONTANTION; N, IN NATIVE WATER;
P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DAY	TIME	WATER TEMPERATURE (°C)	PER- DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT TRATION DISCHARGE (TONS/DAY)	SUSPENDED SEDIMENT PERCENT FINER THAN SIZE INDICATED, IN MILLIMETERS											METHOD OF ANALYSIS	
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.000	2.000		
NOV. 13	1110	5	A 99	28	7.5	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV. 30	1130	4	A 86	18	4.2	--	--	--	--	--	--	--	--	--	--	--	--	--
JULY 17	2200	24	24,100	540	35,100	38	57	77	84	85	92	94	99	100	--	--	--	VPMC
JULY 18	0300	24	26,800	520	37,600	43	55	76	80	85	92	100	--	--	--	--	--	SPMC

A DAILY MEAN DISCHARGE.

WAPSIPINICON RIVER BASIN

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IOWA--Continued

SUSPENDED SEDIMENT, DECEMBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	--	--	--	--	--	--	90	11	2.7
2	--	--	--	--	--	--	95	7	1.8
3	--	--	--	--	--	--	93	6	1.5
4	--	--	--	--	--	--	90	8	1.9
5	--	--	--	--	--	--	96	6	1.6
6	--	--	--	--	--	--	98	8	2.1
7	--	--	--	--	--	--	119	6	1.9
8	--	--	--	--	--	--	124	9	3.0
9	--	--	--	--	--	--	126	5	1.7
10	--	--	--	--	--	--	136	8	2.9
11	--	--	--	--	--	--	134	10	3.6
12	--	--	--	--	--	--	132	10	3.6
13	--	--	--	--	--	--	118	7	2.2
14	--	--	--	--	--	--	91	8	2.0
15	--	--	--	--	--	--	70	6	1.1
16	--	--	--	--	--	--	78	7	1.5
17	--	--	--	--	--	--	103	11	3.1
18	--	--	--	--	--	--	111	14	4.8
19	--	--	--	--	--	--	96	6	1.6
20	--	--	--	--	--	--	110	6	1.8
21	--	--	--	--	--	--	121	7	2.3
22	--	--	--	--	--	--	73	6	1.2
23	--	--	--	--	--	--	85	5	1.1
24	--	--	--	--	--	--	88	6	1.4
25	--	--	--	--	--	--	90	3	.7
26	--	--	--	--	--	--	80	5	1.1
27	--	--	--	--	--	--	71	10	1.9
28	--	--	--	--	--	--	66	6	1.1
29	--	--	--	--	--	--	60	7	1.1
30	--	--	--	--	--	--	59	10	1.6
31	--	--	--	--	--	--	56	18	2.7
TOTAL	--	--	--	--	--	--	2959	--	62.6
	JANUARY			FEBRUARY			MARCH		
1	48	13	1.7	143	71	27	44	11	1.3
2	47	28	3.6	130	56	20	47	11	1.4
3	45	9	1.1	88	38	9.0	47	9	1.1
4	43	8	.9	104	36	10	52	22	3.1
5	41	13	1.4	110	14	4.2	62	10	1.7
6	39	18	1.9	112	10	3.0	64	10	1.7
7	36	22	2.1	93	11	2.8	72	7	1.4
8	36	11	1.1	90	12	2.9	93	7	1.8
9	36	20	1.9	91	10	2.5	205	14	7.7
10	34	21	1.9	76	7	1.4	301	25	20
11	34	17	1.6	80	6	1.3	244	24	16
12	34	25	2.3	74	8	1.6	191	4	2.1
13	34	12	1.1	73	8	1.6	152	6	2.5
14	34	24	2.2	67	8	1.4	189	6	3.1
15	34	10	.9	62	7	1.2	193	9	4.7
16	34	13	1.2	61	6	1.0	185	14	7.0
17	34	5	.5	54	12	1.7	184	11	5.5
18	34	7	.6	52	17	2.4	195	16	8.4
19	34	12	1.1	51	23	3.2	231	9	5.6
20	38	6	.6	47	9	1.1	235	17	11
21	41	4	.4	43	8	.9	216	16	9.3
22	44	10	1.2	40	10	1.1	200	18	9.7
23	44	4	.5	37	6	.6	168	13	5.9
24	44	5	.6	37	8	.8	148	12	4.8
25	43	6	.7	39	8	.8	148	15	6.0
26	44	3	.4	41	8	.9	141	15	5.7
27	46	7	.9	42	10	1.1	149	23	9.3
28	47	5	.6	43	8	.9	150	36	15
29	114	8	2.5	41	6	.7	148	31	12
30	206	34	19	--	--	--	140	30	19
31	166	92	41	--	--	--	169	44	20
TOTAL	1588	--	97.5	2021	--	107.1	4763	--	223.8

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IOWA--Continued

SUSPENDED SEDIMENT, DECEMBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	139	38	14	557	70	110	306	39	32
2	143	45	17	473	54	69	294	36	29
3	178	41	20	414	54	60	278	45	34
4	359	53	51	352	62	59	251	32	22
5	405	31	34	305	63	52	219	32	19
6	317	34	29	264	64	46	196	25	13
7	280	50	38	272	76	56	168	32	15
8	266	58	42	308	60	50	154	28	12
9	249	40	27	322	66	57	175	35	17
10	223	31	19	312	56	47	253	31	21
11	201	44	24	302	51	42	242	38	25
12	188	57	29	281	61	46	236	47	30
13	179	51	25	247	72	48	301	50	41
14	232	49	31	276	75	56	306	35	29
15	244	48	32	267	69	50	241	36	23
16	243	61	40	281	88	67	206	39	22
17	239	41	26	261	62	44	183	46	23
18	216	44	26	280	44	33	168	34	15
19	196	51	27	398	63	68	190	36	15
20	270	64	47	468	50	63	135	52	19
21	323	56	49	513	64	89	135	30	11
22	325	55	48	485	110	140	115	30	9.3
23	667	78	140	401	96	100	116	20	6.3
24	1430	120	460	341	71	65	168	100	45
25	1410	46	180	304	55	45	628	210	360
26	1310	59	210	301	52	42	567	150	230
27	1090	51	150	285	43	33	854	86	200
28	865	52	120	270	34	25	1110	85	250
29	863	57	130	280	35	26	1410	68	260
30	684	51	94	281	35	27	1470	82	330
31	--	--	--	287	95	74	--	--	--
TOTAL	13734	--	2179	10389	--	1789	11035	--	2157.6
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	1690	67	310	1790	47	230	250	63	43
2	2150	62	360	1370	39	140	225	50	30
3	2070	50	280	981	33	87	214	57	33
4	1620	56	240	851	34	78	223	34	20
5	982	64	170	3190	150	1290	241	44	29
6	627	50	85	2770	66	490	255	46	32
7	487	46	60	1620	60	260	285	53	41
8	406	62	68	3350	120	1090	392	56	59
9	357	45	43	7140	96	1850	383	58	60
10	302	41	33	4050	81	890	322	53	46
11	271	47	34	2730	55	410	280	34	26
12	243	47	31	2170	62	360	256	38	26
13	224	49	30	1550	38	160	234	60	38
14	206	42	23	1100	36	110	219	52	31
15	190	49	25	864	44	100	205	45	25
16	402	406	52500	767	34	70	196	78	41
17	15200	840	531100	717	36	70	220	62	37
18	23500	250	164000	612	39	64	240	66	43
19	11000	100	2970	565	37	56	271	62	45
20	3950	92	980	520	36	51	283	59	45
21	2140	80	460	470	38	48	276	60	45
22	1530	58	240	431	41	48	285	62	48
23	2550	170	1170	394	45	48	405	63	69
24	6330	150	2560	363	49	48	600	64	100
25	7150	81	1560	326	63	55	532	64	92
26	4700	71	900	301	42	34	475	47	60
27	3420	51	470	288	39	30	507	49	67
28	3720	63	630	274	70	52	532	71	100
29	3250	67	590	258	69	48	549	55	82
30	2700	49	360	247	54	37	515	53	74
31	2170	48	280	249	32	22	--	--	--
TO-TAL	105537	--	64962	42308	--	8326	9870	--	1487
TOTAL DISCHARGE FOR PERIOD DECEMBER 1967 TO SEPTEMBER 1968 (CFS-DAYS)									204204
TOTAL LOAD FOR PERIOD DECEMBER 1967 TO SEPTEMBER 1968 (TONS)									71169.5
S COMPUTED BY SUBDIVIDING DAY.									

05430500 ROCK RIVER AT AFTON, WIS.

LOCATION.--Lat 42°36'40", long 89°04'10", in sec.27, T.2 N., R.12 E., Rock County, temperature recorder at gaging station on right bank in Afton, 0.3 mile downstream from highway bridge, and 0.8 mile upstream from Bass Creek.

DRAINAGE AREA.--3,300 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: September 1954 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 29.0°C Aug. 23; minimum, freezing point Jan. 7-18.

Period of record:

Water temperatures: Maximum, 32.0°C July 27-30, Aug. 4, 1955, July 26, 28, 1964; minimum, freezing point on many days during winter periods.

REMARKS.--No temperature record Oct. 4, Oct. 30 to Nov. 9, Mar. 28 to Apr. 4.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

MONTH	DAY																															AVER- AGE	
	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		
OCTOBER	18	20	20	--	18	17	16	16	15	14	14	14	14	14	14	15	14	14	14	14	13	14	14	14	14	12	12	11	11	--	--	15	
MINIMUM	16	17	18	--	17	16	16	15	14	13	12	12	13	13	13	13	13	13	13	13	12	12	12	12	14	12	12	11	10	--	--	13	
NOVEMBER	MAXIMUM	--	--	--	--	--	--	--	--	--	2	3	4	5	5	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	--	--	
MINIMUM	--	--	--	--	--	--	--	--	--	--	2	3	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	1	1	2	--	--	
DECEMBER	MAXIMUM	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	3	3	2	1	1	1	1	1	1	1	2	
MINIMUM	2	2	1	2	2	2	2	3	3	3	3	3	3	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	
JANUARY	MAXIMUM	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	3	2	2	2	2	2	2	1	
MINIMUM	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	2	2	1	1	
FEBRUARY	MAXIMUM	2	3	3	3	3	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	--	2	
MINIMUM	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	--	2	
MARCH	MAXIMUM	4	3	4	5	5	6	6	6	6	6	6	6	6	7	8	8	9	9	8	7	7	8	7	7	8	9	11	12	--	7		
MINIMUM	2	3	2	3	3	3	4	5	4	4	4	3	4	4	5	6	7	8	8	7	6	4	4	6	8	10	--	--	--	--	5		
APRIL	MAXIMUM	--	--	--	--	10	10	11	10	12	12	13	14	13	13	13	13	12	12	13	13	14	16	14	13	11	11	12	12	13	14	--	12
MINIMUM	--	--	--	--	8	7	7	9	8	9	9	11	12	11	10	11	12	11	12	12	11	12	13	13	11	10	10	11	12	12	--	11	
MAY	MAXIMUM	14	16	16	15	15	14	16	15	16	16	17	18	18	19	18	17	16	15	14	13	14	16	15	17	16	15	14	15	15	17	16	
MINIMUM	13	14	16	14	14	13	14	14	14	14	14	14	15	17	16	14	14	13	14	14	13	14	14	14	14	15	14	14	14	14	14	14	
JUNE	MAXIMUM	19	20	21	22	23	24	26	26	27	28	27	24	24	23	23	23	22	22	22	23	23	24	23	23	21	19	17	18	20	--	23	
MINIMUM	16	17	18	19	20	22	23	23	24	25	24	22	19	20	19	19	19	19	20	20	21	22	23	21	19	16	15	17	19	--	20		
JULY	MAXIMUM	22	21	20	21	22	23	23	23	23	23	24	25	26	26	27	27	27	27	27	27	27	27	26	25	26	26	26	26	26	26	23	25
MINIMUM	20	20	19	20	21	21	22	21	22	22	22	22	23	24	24	24	26	26	25	25	24	25	24	23	24	23	24	23	24	22	22	23	
AUGUST	MAXIMUM	23	24	25	24	26	28	28	27	28	26	24	25	24	23	24	23	22	26	27	28	29	28	24	23	22	22	22	22	22	21	25	
MINIMUM	20	21	21	21	23	24	24	24	24	23	22	22	21	21	21	22	21	20	21	22	23	24	24	24	22	21	19	19	19	13	19	22	
SEPTEMBER	MAXIMUM	21	22	23	22	22	21	20	19	18	18	18	18	20	21	21	20	19	18	18	19	19	20	20	19	18	18	17	18	18	--	20	
MINIMUM	19	18	19	20	19	18	18	18	17	16	16	17	17	18	18	19	18	17	16	18	18	18	17	16	18	18	17	16	15	15	--	18	

IOWA RIVER BASIN

05454500 IOWA RIVER AT IOWA CITY, IOWA

LOCATION.--Lat 41°39'24", long 91°32'28", in SE $\frac{1}{4}$ sec.9, T.79 N., R.6 W., Johnson County, at Benton Street bridge at Iowa City, 0.5 mile downstream from gaging station, 0.4 mile upstream from Ralston Creek, 4.1 mile downstream from Clear Creek, and at mile 73.7.

DRAINAGE AREA.--3,271 sq mi.

PERIOD OF RECORD.--Chemical analyses: September 1968 to September 1967, January 1944 to September 1954.

Water temperatures: January 1944 to September 1968.

Sediment records: October 1943 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 29.0°C Aug. 21; minimum, freezing point on many days during December to February. Sediment concentrations: Maximum daily, 530 mg/l July 19; minimum daily, 5 mg/l Jan. 1.

Sediment loads: Maximum daily, 2,730 tons Nov. 2; minimum daily, 4 tons Jan. 1, 9, 10, 12, 13.

Period of record:

Water temperatures 1944-68: Maximum, 32.0°C July 19, 1957, Aug. 24, 25, 1959; minimum freezing point on many days during winter periods.

Sediment concentrations: Maximum daily, 7,800 mg/l June 13, 1953; minimum daily, 2 mg/l Dec. 16, 18, 20, 21, 27, 1963.

Sediment loads: Maximum daily, 177,000 tons May 23, 1944; minimum daily, 0.9 tons Dec. 16, 1963.

REMARKS.--Diurnal fluctuation at low stages caused by power plants upstream from station. Flow regulated by Coralville Reservoir upstream from Iowa City beginning Sept. 17, 1958 (total capacity, 492,000 acre-ft). Flow affected by ice Dec. 30 to Jan. 8. Maximum observed concentration during water year 530 mg/l July 19.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	9.0	---	0	3.0	4.0	12.0	17.0	18.0	25.0	26.0	23.0
2	--	9.0	---	0	4.0	4.0	---	19.0	---	23.0	25.0	24.0
3	20.0	8.0	---	0	4.0	4.0	12.0	20.0	19.0	24.0	---	24.0
4	21.0	7.0	---	1.0	6.0	6.0	12.0	19.0	20.0	24.0	---	23.0
5	20.0	6.0	---	1.0	3.0	4.0	12.0	18.0	25.0	25.0	---	23.0
6	19.0	7.0	---	0	4.0	6.0	12.0	17.0	24.0	---	27.0	22.0
7	---	7.0	---	0	3.0	5.0	12.0	---	27.0	24.0	27.0	22.0
8	14.0	7.0	5.0	0	3.0	0.0	12.0	18.0	26.0	26.0	27.0	21.0
9	13.0	8.0	4.0	0	---	5.0	12.0	18.0	24.0	26.0	26.0	19.0
10	12.0	8.0	3.0	0	0	5.0	13.0	23.0	26.0	26.0	27.0	18.0
11	13.0	8.0	3.0	1.0	2.0	6.0	14.0	17.0	21.0	26.0	27.0	20.0
12	13.0	8.0	3.0	1.0	2.0	3.0	15.0	15.0	21.0	26.0	27.0	22.0
13	16.0	6.0	3.0	1.0	3.0	4.0	15.0	---	26.0	27.0	27.0	22.0
14	15.0	6.0	2.0	1.0	1.0	4.0	14.0	19.0	26.0	27.0	27.0	22.0
15	14.0	6.0	2.0	1.0	3.0	6.0	13.0	19.0	---	27.0	27.0	22.0

05454500 IOWA RIVER AT IOWA CITY, IOWA--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

JAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
16	14.0	6.0	2.0	1.0	4.0	7.0	12.0	17.0	24.0	26.0	27.0	20.0
17	14.0	7.0	3.0	2.0	3.0	7.0	15.0	18.0	24.0	27.0	---	20.0
18	14.0	---	2.0	2.0	1.0	7.0	16.0	17.0	26.0	28.0	---	19.0
19	13.0	5.0	2.0	---	3.0	9.0	14.0	18.0	26.0	28.0	28.0	20.0
20	13.0	4.0	4.0	3.0	0	7.0	14.0	18.0	26.0	27.0	28.0	20.0
21	14.0	6.0	1.0	3.0	2.0	6.0	16.0	18.0	26.0	27.0	29.0	21.0
22	12.0	4.0	2.0	3.0	2.0	5.0	16.0	18.0	26.0	26.0	26.0	22.0
23	15.0	3.0	1.0	2.0	1.0	---	16.0	---	25.0	27.0	26.0	23.0
24	12.0	5.0	1.0	1.0	3.0	6.0	14.0	19.0	24.0	27.0	27.0	---
25	11.0	5.0	1.0	3.0	2.0	8.0	14.0	19.0	23.0	27.0	26.0	22.0
26	9.0	4.0	0	3.0	2.0	10.0	13.0	16.0	23.0	27.0	26.0	22.0
27	7.0	2.0	0	4.0	1.0	12.0	13.0	15.0	22.0	27.0	22.0	22.0
28	8.0	2.0	0	4.0	2.0	12.0	13.0	15.0	21.0	26.0	22.0	22.0
29	8.0	2.0	---	3.0	2.0	13.0	14.0	17.0	22.0	27.0	22.0	22.0
30	8.0	1.0	0	4.0	---	13.0	15.0	---	26.0	26.0	22.0	24.0
31	9.0	---	0	4.0	---	13.0	---	17.0	---	---	22.0	---
AVERAGE	13.5	5.5	---	1.5	2.5	7.0	13.5	18.0	23.5	26.0	26.0	21.5

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	560	57	86	2290	83	510	374	13	13
2	560	54	82	3060	330	2730	374	12	12
3	550	51	76	2650	170	1220	366	15	15
4	545	47	69	1720	160	740	366	12	12
5	499	37	50	1620	47	210	362	13	13
6	206	37	21	1250	33	110	366	12	12
7	216	50	29	630	29	49	374	23	23
8	575	250	390	490	23	30	390	16	17
9	303	110	90	485	38	50	434	21	25
10	370	61	61	470	31	39	442	13	16
11	520	42	59	465	31	39	446	13	16
12	550	49	73	450	32	39	450	11	14
13	618	50	83	589	30	48	490	14	19
14	672	46	83	1050	19	54	603	9	15
15	924	78	190	1040	22	62	1320	15	53
16	980	79	210	973	35	92	1560	16	67
17	1050	58	160	836	21	36	1570	17	72
18	1010	71	190	618	23	38	1570	14	59
19	903	35	85	606	20	33	1560	12	51
20	600	35	57	606	18	29	1550	13	54
21	450	28	34	606	16	26	1330	24	86
22	426	36	41	595	16	26	520	26	37
23	406	52	57	585	14	22	346	9	8
24	535	48	69	580	13	19	356	12	11
25	600	110	180	438	15	18	354	11	11
26	460	81	100	422	16	18	346	8	7
27	475	34	44	410	15	17	350	8	8
28	585	32	51	386	14	15	354	9	8
29	612	28	46	374	12	13	354	8	8
30	1280	110	380	374	14	14	350	10	9
31	2000	89	480	---	---	---	340	10	9
TOTAL	20040	---	3626	26438	---	6346	19975	---	781
		JANUARY		FEBRUARY		MARCH			
1	320	5	4	1820	50	250	257	12	8
2	330	9	8	2080	42	240	264	21	15
3	325	6	5	2010	29	160	257	30	21
4	320	6	5	1990	30	160	260	41	29
5	315	8	7	1680	30	140	323	80	70
6	310	6	5	1400	15	57	422	52	59
7	310	6	5	1360	12	44	505	29	40
8	300	6	5	1350	17	62	570	44	68
9	247	6	4	1270	10	34	640	38	66
10	233	6	4	1050	14	40	615	34	56
11	233	18	11	1050	20	57	874	43	100
12	241	6	4	1130	33	100	1180	24	76
13	238	7	4	1380	39	150	1180	29	92
14	238	11	7	1909	16	47	854	31	71
15	241	15	10	540	28	41	410	30	33
16	241	13	8	358	58	56	410	26	29
17	238	15	10	342	26	24	410	35	39
18	244	14	9	338	20	18	434	110	130
19	261	15	11	338	14	13	560	49	74
20	288	16	12	320	12	10	645	57	99
21	334	14	13	242	25	16	630	57	97
22	315	57	48	239	12	8	620	140	230
23	324	17	15	239	11	7	610	74	120
24	378	15	15	242	9	6	610	54	89
25	406	14	15	245	11	7	515	57	84
26	402	15	16	245	12	8	410	55	61
27	418	9	10	248	11	7	410	69	76
28	450	11	13	234	11	8	414	57	64
29	475	16	21	248	12	8	406	67	73
30	442	21	25	---	---	---	398	52	56
31	797	40	86	---	---	---	406	140	150
TOTAL	10206	---	415	25098	---	1778	16529	---	2275

IOWA RIVER BASIN

05454500 IOWA RIVER AT IOWA CITY, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE			
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	
1	398	68	73	1560	130	550	788	54	110	
2	394	55	59	1400	120	450	746	45	91	
3	426	62	71	1200	120	390	645	37	64	
4	1340	210	740	1060	100	290	495	42	56	
5	1990	83	450	1060	120	340	442	54	64	
6	560	58	88	956	150	390	338	110	100	
7	860	60	91	758	130	270	248	56	37	
8	829	71	160	645	99	170	242	50	33	
9	1180	73	230	630	86	150	260	48	34	
10	1410	97	370	630	87	150	264	49	35	
11	1230	120	400	625	85	140	257	60	42	
12	525	100	140	625	93	160	186	59	30	
13	530	120	170	620	81	140	148	54	22	
14	590	120	190	620	63	110	257	69	48	
15	789	130	280	635	70	120	173	60	28	
16	1110	110	330	665	70	130	140	53	20	
17	1160	120	380	746	50	100	136	51	19	
18	1120	120	360	746	71	140	128	54	19	
19	949	110	280	740	59	120	128	50	17	
20	776	130	270	735	51	100	138	52	19	
21	695	130	240	735	57	110	143	150	58	
22	1080	120	350	675	59	110	143	140	54	
23	2030	240	1320	540	50	73	143	150	58	
24	2700	240	1750	535	40	58	192	260	130	
25	2510	190	1290	545	44	65	530	150	210	
26	2240	310	1870	640	41	71	434	150	140	
27	1990	300	1610	620	64	110	281	180	92	
28	1990	150	810	580	27	42	227	150	100	
29	2130	150	860	595	46	74	239	160	80	
30	2040	150	830	770	48	100	248	120	---	
31	--	--	--	764	50	100	--	--	---	
TOTAL	37231	--	16062	23655	--	5323	8739	--	1990	
		JULY			AUGUST			SEPTEMBER		
1	278	120	90	818	110	240	326	60	53	
2	944	300	760	830	110	250	306	57	47	
3	1600	150	650	830	110	250	302	70	57	
4	1610	140	610	836	260	590	306	63	52	
5	1520	130	530	1440	250	970	302	51	42	
6	1310	150	530	2760	250	1860	316	56	48	
7	1310	170	600	2910	300	2360	386	53	55	
8	1120	160	480	2480	120	800	410	48	53	
9	776	130	270	1990	150	810	406	51	56	
10	675	220	400	1760	150	710	446	42	51	
11	610	130	210	1750	150	710	490	49	65	
12	560	120	180	1440	150	580	486	38	50	
13	515	130	180	1110	230	690	430	38	44	
14	505	130	180	938	130	330	378	40	41	
15	495	130	170	938	120	300	382	40	41	
16	430	130	150	896	100	240	446	45	54	
17	442	100	120	695	100	190	520	65	91	
18	446	120	140	700	100	190	446	83	100	
19	515	530	740	695	100	190	434	69	81	
20	812	190	420	690	67	140	402	51	55	
21	818	160	350	650	76	130	323	57	50	
22	1410	180	690	610	60	99	323	50	44	
23	2830	190	1450	490	58	77	292	45	35	
24	2920	220	1730	346	52	49	212	36	21	
25	2810	150	1140	342	70	65	170	38	17	
26	2370	150	960	346	46	43	166	60	27	
27	2060	160	890	338	43	39	166	50	22	
28	2020	180	980	312	39	33	158	36	15	
29	1700	430	1970	312	43	36	168	28	13	
30	956	130	340	312	57	48	163	36	16	
31	818	130	290	342	53	49	--	--	--	
TOTAL	37185	--	18200	30906	--	13068	10061	--	1396	
	TOTAL DISCHARGE FOR YEAR (CFS DAYS)									266063
	TOTAL LOAD FOR YEAR (TONS)									71260

IOWA RIVER BASIN

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05455000 RALSTON CREEK AT IOWA CITY, IOWA

LOCATION.--Lat 41°39'51", long 91°30'48", in SE¼ sec.11, T.79 N., Johnson County, at gaging station at bridge on Rochester Avenue, (formerly State Highway 1), near east edge of Iowa City, and 2.2 miles upstream from mouth.

DRAINAGE AREA.--3.01 sq mi.

PERIOD OF RECORD.--Chemical analyses: April to September 1968.
Water temperatures: April 1952 to September 1968.
Sediment records: April 1952 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 31.0°C July 21; minimum, freezing point on many days during December to March.
Sediment concentrations: Maximum daily, 2,310 mg/l May 26; minimum daily, no flow Aug. 25-30.
Sediment loads: Maximum daily, 220 ton May 26; minimum daily, 0 tons Aug. 25-30.

Period of record:

Water temperatures (1960-68): Maximum, 31.0°C July 21, 1966; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 6,700 mg/l May 23, 1966; minimum daily, no flow on many days in 1953-59, 1963-68.
Sediment loads: Maximum daily, 4,300 tons May 23, 1966; minimum daily, 0 tons on many days in 1953-59, 1963-68.

REMARKS.--Maximum observed concentration during water year, 1,970 mg/l May 25. Flow affected by ice Nov. 22-30, Dec. 14 to Jan. 29, Feb. 3-10, 15, 18, Feb. 19 to Mar. 8.

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C) APRIL TO SEPTEMBER 1968

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	810	730	610	560	620	600	590	560	--	--
2	--	--	1000	810	610	600	620	570	590	560	--	--
3	--	--	1000	800	620	610	580	540	560	530	--	--
4	--	--	800	750	630	620	580	380	570	380	--	--
5	--	--	750	720	620	560	550	540	490	380	--	--
6	--	--	800	730	580	580	570	530	--	--	--	--
7	--	--	810	750	580	580	530	580	--	--	--	--
8	--	--	960	750	--	--	560	510	--	--	--	--
9	--	--	900	840	--	--	530	370	--	--	--	--
10	--	--	950	660	620	400	540	500	580	540	--	--
11	--	--	800	610	840	490	560	500	590	520	460	440
12	--	--	810	720	650	640	530	480	600	520	510	440
13	--	--	860	700	640	600	530	490	600	540	570	510
14	--	--	1000	720	620	400	530	490	580	540	610	560
15	--	--	1000	740	640	600	550	480	550	530	620	600
16	--	--	--	--	840	610	560	410	590	540	620	400
17	--	--	940	700	610	600	550	350	580	580	540	420
18	--	--	700	640	810	530	540	440	--	--	600	540
19	600	350	700	640	560	480	580	540	590	370	600	580
20	580	440	790	680	560	460	580	500	610	560	660	660
21	590	580	950	780	560	460	550	490	580	560	660	650
22	600	590	950	800	560	450	550	500	560	540	650	580
23	610	530	950	760	550	290	550	370	--	--	600	490
24	590	580	950	470	620	320	--	--	--	--	560	560
25	600	580	570	410	560	380	--	--	--	--	360	640
26	600	580	580	460	580	440	550	540	--	--	660	650
27	600	580	580	460	610	580	560	360	--	--	670	640
28	590	440	600	500	640	610	--	--	--	--	670	660
29	600	550	530	450	630	440	--	--	--	--	660	510
30	730	580	610	530	600	520	--	--	--	--	640	600
31	--	--	640	450	--	--	--	--	--	--	--	--

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	10.0	5.0	0	0	0	14.0	21.0	23.0	23.0	27.0	26.0
2	21.0	10.0	4.0	0	0	0	13.0	21.0	27.0	23.0	27.0	26.0
3	18.0	9.0	4.0	0	0	0	12.0	21.0	28.0	23.0	27.0	27.0
4	18.0	9.0	4.0	0	0	0	7.0	16.0	28.0	24.0	27.0	22.0
5	18.0	9.0	5.0	0	0	1.0	9.0	20.0	31.0	24.0	27.0	22.0
6	17.0	9.0	4.0	0	0	1.0	10.0	21.0	29.0	24.0	28.0	22.0
7	16.0	9.0	4.0	0	0	1.0	10.0	21.0	30.0	24.0	27.0	22.0
8	15.0	9.0	4.0	0	0	1.0	11.0	16.0	30.0	26.0	27.0	21.0
9	15.0	9.0	4.0	0	0	1.0	13.0	15.0	30.0	27.0	27.0	21.0
10	14.0	9.0	4.0	0	0	1.0	16.0	16.0	30.0	27.0	27.0	21.0
11	15.0	9.0	4.0	0	0	1.0	21.0	18.0	30.0	29.0	27.0	21.0
12	16.0	8.0	4.0	0	0	1.0	20.0	22.0	29.0	29.0	27.0	21.0
13	16.0	8.0	4.0	0	0	1.0	19.0	23.0	29.0	29.0	27.0	20.0
14	15.0	8.0	4.0	0	0	1.0	20.0	27.0	29.0	29.0	27.0	21.0
15	15.0	7.0	4.0	0	0	1.0	20.0	26.0	29.0	29.0	27.0	21.0
16	15.0	7.0	4.0	0	0	2.0	21.0	22.0	29.0	29.0	27.0	20.0
17	14.0	7.0	4.0	0	0	1.0	21.0	19.0	29.0	27.0	27.0	20.0
18	13.0	7.0	4.0	0	0	4.0	21.0	16.0	29.0	28.0	27.0	21.0
19	14.0	7.0	2.0	0	0	6.0	19.0	16.0	29.0	29.0	27.0	20.0
20	14.0	7.0	1.0	0	0	5.0	16.0	21.0	29.0	30.0	27.0	20.0
21	15.0	6.0	1.0	0	0	5.0	16.0	19.0	29.0	31.0	27.0	21.0
22	16.0	6.0	1.0	0	0	6.0	21.0	19.0	27.0	30.0	27.0	21.0
23	16.0	6.0	1.0	0	0	5.0	10.0	19.0	28.0	29.0	27.0	21.0
24	11.0	6.0	0	0	0	6.0	7.0	19.0	27.0	27.0	27.0	21.0
25	9.0	6.0	0	0	0	6.0	10.0	16.0	26.0	28.0	27.0	19.0
26	6.0	5.0	0	0	0	17.0	16.0	16.0	17.0	28.0	28.0	18.0
27	6.0	4.0	0	0	0	16.0	15.0	21.0	18.0	28.0	27.0	16.0
28	6.0	4.0	0	0	0	18.0	14.0	23.0	19.0	26.0	27.0	16.0
29	9.0	3.0	0	0	0	18.0	18.0	22.0	19.0	27.0	27.0	16.0
30	10.0	4.0	0	0	---	16.0	22.0	22.0	23.0	26.0	26.0	16.0
31	10.0	---	0	0	---	15.0	---	23.0	---	26.0	26.0	---
AVERAGE	14.0	7.0	2.5	0	0	5.0	15.5	23.0	27.0	27.0	27.0	20.5

05455000 RALSTON CREEK AT IOWA CITY, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY
1	0.31	36	T	16	1160	S63	1.0	70	0.2
2	.28	24	T	19	190	S11	1.1	47	.1
3	.27	23	T	8.7	80	1.9	.94	96	.2
4	.31	45	T	5.5	54	.8	.95	77	.2
5	.36	52	.1	4.3	42	.5	1.0	43	.1
6	.38	49		3.7	40	.4	1.0	54	.1
7	4.3	670	S26	3.0	57	.5	1.2	75	.2
8	8.0	220	3.6	2.8	56	.4	.92	85	.2
9	1.9	37	.2	2.5	16	.1	1.1	82	.2
10	1.3	48	.2	2.4	20	.1	1.1	45	.1
11	1.0	56	.2	2.2	19	.1	1.1	61	.2
12	.91	49	.1	1.9	30	.2	1.0	66	.2
13	.85	32	.1	1.8	28	.1	.80	130	.3
14	.69	25	T	1.8	54	.3	.62	150	.3
15	7.9	940	S40	1.6	51	.2	.70	150	.3
16	2.8	140	1.1	1.6	74	.3	.90	56	.1
17	2.0	31	.2	1.9	39	.2	1.1	44	.1
18	1.5	34	.1	1.3	27	.1	1.1	68	.1
19	1.3	39	.1	1.4	47	.2	.92	51	.1
20	1.2	30	.1	1.5	47	.2	1.0	26	.1
21	1.0	19		1.4	51	.2	.90	36	.1
22	.97	19	T	1.3	46	.2	.70	71	.1
23	.91	33	.1	1.3	41	.1	.60	85	.1
24	7.2	1060	S37	1.2	33	.1	.86	70	.1
25	3.0	100	.8	1.2	32	.1	.72	27	.1
26	2.1	47	.3	1.1	35	.1	.78	47	.1
27	2.2	49	.3	1.0	34	.1	.84	39	.1
28	2.2	33	.2	.80	38	.1	.60	45	.1
29	3.0	570	S9.9	.87	42	.1	.64	32	.1
30	11	1590	S62	.92	80	.2	.66	25	T
31	8.8	67	1.2	--	--	--	.64	23	T
TOTAL	75.94	--	184.3	96.19	--	81.9	27.09	--	4.5
	JANUARY			FEBRUARY			MARCH		
1	0.62	110	0.2	1.1	8	0.2	0.45	52	0.1
2	.58	160	.3	1.4	5	T	.48	12	T
3	.52	110	.2	.90	5	T	.34	19	T
4	.48	64	.1	.75	8	T	.48	16	T
5	.44	53	.1	.68	31	.1	.50	14	T
6	.43	55	.1	.58	33	.1	.45	31	T
7	.42	59	.1	.52	34	T	.50	11	T
8	.43	49	.1	.50	3	T	1.5	27	.1
9	.46	43	.1	.55	2	T	1.3	25	.1
10	.46	41	.1	.40	15	T	.73	26	.1
11	.52	52	.1	.32	15	T	.61	27	T
12	.56	57	.1	.30	27	T	.52	22	T
13	.60	41	.1	.27	19	T	.43	40	T
14	.84	25	T	.28	21	T	.54	17	T
15	.70	17	T	.29	14	T	.56	12	T
16	.80	22	T	.31	13	T	.68	21	T
17	1.0	22	.1	.25	17	T	.68	15	T
18	1.5	23	.1	.22	18	T	1.8	73	.4
19	2.2	18	.1	.25	13	T	2.3	26	.2
20	3.0	20	.2	.28	11	T	1.1	49	.1
21	2.5	49	.3	.32	19	T	.77	45	.1
22	2.0	26	.1	.35	40	T	.61	46	.1
23	1.3	100	.4	.33	66	T	.59	65	.1
24	.90	43	.1	.31	65	T	.64	52	.1
25	.70	43	.1	.30	53	T	.77	50	.1
26	.78	55	.1	.90	47	T	.83	50	.1
27	2.0	80	.3	.29	26	T	.85	40	.1
28	3.0	78	.6	.30	54	T	.79	61	.1
29	2.0	82	.4	.31	47	T	.69	46	.1
30	1.1	56	.2	--	--	--	.75	77	.2
31	1.9	150	.8	--	--	--	1.1	58	.2
TOTAL	34.58	--	5.7	22.84	--	1.0	24.32	--	2.8

S COMPUTED BY SUBDIVIDING DAY.
T LESS THAN 0.05 TON.

05455000 RALSTON CREEK AT IOWA CITY, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY
1	0.82	21	T	1.1	180	0.5	1.7	290	1.3
2	.75	20		.99	22	.1	1.0	73	.2
3	1.6	860	3.2	.89	21	.1	.85	50	.1
4	.99	40	.1	.82	22	T	.71	87	.1
5	.89	42	.1	.75	19	T	.61	53	.1
6	.79	82	.1	.71	7	T	.58	220	.3
7	.70	52	.1	1.1	53	T	.52	190	.3
8	.59	72	.1	1.3	150	.5	.40	160	.2
9	.54	57	.1	.83	27	.1	.66	410	S.8
10	.49	58	.1	.75	30	.1	.64	440	S1.4
11	.44	110	.1	.87	21	T	.76	800	1.2
12	.49	74	.1	.82	26	T	.40	210	.2
13	.92	56	.1	.59	38	.1	.38	190	.2
14	3.2	380	3.1	.73	130	.3	1.3	370	S3.0
15	1.4	55	.2	1.5	360	S2.6	.51	150	.2
16	1.2	70	.2	.92	150	.4	.42	100	.1
17	2.3	86	.4	.66	160	.3	.40	88	.1
18	1.3	110	.4	.81	53	.1	.38	110	.1
19	1.9	70	.4	.82	93	.2	.31	170	.1
20	6.0	30	.5	.52	54	.1	.31	72	.1
21	3.0	45	.4	.48	33	T	.34	100	.1
22	2.3	130	.8	.83	59	.1	.36	57	.1
23	3.3	130	1.2	.75	32	.1	.41	370	S1.2
24	2.6	18	.1	.54	72	.1	2.5	1320	S14
25	2.0	29	.2	1.2	1520	S11	4.2	640	S11
26	1.8	25	.1	11	2310	S220	7.0	590	S21
27	1.5	17	.1	2.7	88	6.4	1.7	100	.5
28	1.6	270	1.2	2.0	86	.4	1.0	230	.6
29	1.7	78	.3	2.2	110	.7	2.6	370	S6.8
30	1.3	80	.3	1.2	110	.4	1.1	300	.9
31	--	--	--	1.6	300	S1.9	--	--	--
TOTAL	48.61	--	14.2	40.88	--	246.8	34.13	--	66.3
		JULY			AUGUST			SEPTEMBER	
1	0.71	80	0.2	0.15	17	T	0.49	100	0.1
2	.55	82	.1	.14	15	T	.12	64	T
3	.42	70	.1	.11	51	T	.11	49	T
4	.59	390	B.3	.07	80	T	.17	49	T
5	.53	100	.1	.83	720	S2.8	.19	18	T
6	.35	50	BT	.18	200	.1	.11	18	T
7	.40	70	B.1	.14	96	T	.09	2	T
8	.32	80	B.1	.12	36	T	.56	400	S1.2
9	.52	340	S.6	.13	91	T	.31	70	B.1
10	.27	110	.1	.12	25	T	.18	31	T
11	.29	80	.1	.10	40	T	.13	13	T
12	.23	120	.1	.09	54	T	.12	62	T
13	.21	130	.1	.09	100	T	.10	51	T
14	.20	110	.1	.09	140	T	.09	160	T
15	.18	69	T	.09	44	T	.08	120	T
16	.22	39	T	.10	180	T	1.4	1500	S6.1
17	.47	390	S1.3	.09	8	T	4.1	1430	S40
18	.46	150	.2	.11	8	T	1.3	650	2.3
19	.21	20	T	.11	33	T	1.3	1100	3.9
20	.17	200	.1	.07	43	T	.52	180	.3
21	.16	140	.1	.04	100	T	.40	36	T
22	.18	110	T	.03	120	T	.79	370	B.9
23	.88	350	S.9	.02	110	T	2.1	550	S3.1
24	.82	300	.5	.01	230	T	.89	26	T
25	.23	200	.1	0	0	0	.42	23	T
26	.19	160	.1	0	0	0	.29	15	T
27	.98	570	S2.2	0	0	0	.24	20	T
28	.22	160	.1	0	0	0	.27	18	T
29	.18	160	.1	0	0	0	.58	65	.1
30	.17	99	T	0	0	0	.30	8	T
31	.18	180	.1	2.0	660	S3.0	--	--	--
TOTAL	11.25	--	8.1	4.81	--	6.3	17.73	--	56.4

TOTAL DISCHARGE FOR YEAR (CFS DAYS)

TOTAL LOAD FOR YEAR (TONS)

438.35

660.3

B COMPUTED FROM ESTIMATED CONCENTRATION GRAPH.

S COMPUTED BY SUBDIVIDING DAY.

T LESS THAN 0.05 TON.

IOWA RIVER BASIN

05462000 SHELL ROCK RIVER AT SHELL ROCK, IOWA

LOCATION,--Lat 42°42'50", long 92°34'55", in NW¼NE¼ sec.11, T.91 N., R.15 W., Butler County, temperature recorder at gaging station, 400 ft upstream from bridge on State Highway 3 in Shell Rock, and 11 miles upstream from mouth.

DRAINAGE AREA,--1,746 sq mi.

PERIOD OF RECORD,--Water temperatures: June 1953 to September 1968 (discontinued).

EXTREMES,--1967-68:

Water temperatures: Maximum, 24.0°C July 14, 15; minimum, 1.0°C many days during December to March.

Period of record:

Water temperatures: Maximum, 31.0°C June 19, 1953; minimum, freezing point on many days in 1954, 1956, 1963-66.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	12.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	1.0
2	14.0	13.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
3	15.0	14.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
4	16.0	15.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
5	16.0	16.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
6	16.0	15.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
7	15.0	13.0	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0
8	13.0	12.0	---	---	---	---	2.0	2.0	1.0	1.0	3.0	2.0
9	12.0	10.0	---	---	---	---	2.0	2.0	1.0	1.0	3.0	2.0
10	10.0	8.0	---	---	---	---	2.0	2.0	2.0	1.0	2.0	2.0
11	8.0	8.0	---	---	---	---	2.0	2.0	2.0	2.0	2.0	2.0
12	9.0	8.0	---	---	---	---	2.0	2.0	2.0	2.0	3.0	2.0
13	11.0	9.0	---	---	---	---	2.0	2.0	2.0	1.0	2.0	2.0
14	11.0	11.0	---	---	---	---	2.0	2.0	2.0	1.0	2.0	2.0
15	11.0	11.0	---	---	---	---	2.0	2.0	1.0	1.0	3.0	2.0
16	11.0	11.0	---	---	---	---	2.0	2.0	2.0	1.0	3.0	3.0
17	11.0	11.0	---	---	---	---	2.0	1.0	2.0	1.0	3.0	3.0
18	---	---	---	---	2.0	1.0	1.0	1.0	2.0	2.0	6.0	3.0
19	---	---	---	---	2.0	1.0	1.0	1.0	2.0	2.0	7.0	6.0
20	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0	7.0	6.0
21	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0	6.0	4.0
22	---	---	---	---	2.0	2.0	1.0	1.0	2.0	2.0	4.0	4.0
23	---	---	---	---	2.0	2.0	1.0	1.0	2.0	1.0	4.0	3.0
24	---	---	---	---	2.0	2.0	1.0	1.0	2.0	1.0	4.0	3.0
25	---	---	---	---	2.0	2.0	1.0	1.0	1.0	1.0	6.0	4.0
26	---	---	---	---	2.0	2.0	1.0	1.0	1.0	1.0	7.0	6.0
27	---	---	---	---	2.0	2.0	1.0	1.0	1.0	1.0	8.0	7.0
28	---	---	---	---	2.0	2.0	1.0	1.0	1.0	1.0	9.0	8.0
29	---	---	---	---	2.0	2.0	1.0	1.0	2.0	1.0	9.0	8.0
30	---	---	---	---	2.0	2.0	1.0	1.0	---	---	9.0	8.0
31	---	---	---	---	2.0	2.0	1.0	1.0	---	---	10.0	9.0
MONTH	---	---	---	---	---	---	2.0	2.0	2.0	1.0	4.0	3.0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	10.0	10.0	14.0	13.0	---	---	20.0	19.0	22.0	21.0	18.0	17.0
2	10.0	9.0	15.0	14.0	---	---	20.0	19.0	21.0	21.0	18.0	17.0
3	9.0	8.0	16.0	15.0	---	---	20.0	19.0	21.0	21.0	19.0	18.0
4	9.0	8.0	16.0	14.0	---	---	21.0	20.0	21.0	21.0	19.0	18.0
5	8.0	7.0	14.0	13.0	---	---	21.0	21.0	22.0	20.0	18.0	17.0
6	7.0	7.0	14.0	13.0	---	---	22.0	21.0	22.0	22.0	17.0	16.0
7	7.0	7.0	13.0	12.0	---	---	22.0	21.0	22.0	21.0	17.0	16.0
8	8.0	7.0	12.0	11.0	---	---	22.0	22.0	23.0	22.0	17.0	17.0
9	8.0	8.0	12.0	12.0	---	---	22.0	22.0	23.0	23.0	17.0	17.0
10	8.0	8.0	12.0	11.0	---	---	22.0	22.0	23.0	23.0	17.0	16.0
11	9.0	8.0	12.0	12.0	---	---	23.0	22.0	23.0	21.0	17.0	16.0
12	10.0	9.0	13.0	12.0	---	---	23.0	22.0	22.0	21.0	17.0	16.0
13	11.0	10.0	14.0	13.0	---	---	23.0	22.0	22.0	21.0	18.0	17.0
14	11.0	10.0	14.0	13.0	---	---	24.0	23.0	22.0	21.0	18.0	17.0
15	11.0	9.0	14.0	13.0	---	---	24.0	24.0	21.0	21.0	18.0	17.0
16	10.0	10.0	14.0	14.0	---	---	23.0	22.0	21.0	21.0	18.0	18.0
17	11.0	10.0	14.0	14.0	---	---	22.0	22.0	21.0	21.0	18.0	17.0
18	11.0	10.0	14.0	13.0	19.0	18.0	23.0	22.0	21.0	20.0	---	---
19	12.0	11.0	13.0	12.0	19.0	18.0	23.0	23.0	21.0	20.0	---	---
20	11.0	10.0	13.0	13.0	19.0	19.0	23.0	22.0	21.0	21.0	---	---
21	12.0	11.0	13.0	13.0	20.0	19.0	23.0	22.0	22.0	21.0	---	---
22	12.0	11.0	13.0	13.0	21.0	20.0	22.0	22.0	23.0	22.0	---	---
23	12.0	11.0	13.0	13.0	22.0	21.0	22.0	20.0	23.0	23.0	---	---
24	11.0	9.0	---	---	22.0	21.0	21.0	21.0	23.0	23.0	---	---
25	9.0	8.0	---	---	22.0	21.0	22.0	21.0	23.0	22.0	---	---
26	8.0	8.0	---	---	21.0	18.0	22.0	22.0	22.0	20.0	---	---
27	9.0	8.0	---	---	18.0	16.0	22.0	22.0	20.0	18.0	---	---
28	11.0	9.0	---	---	16.0	14.0	22.0	22.0	19.0	18.0	---	---
29	12.0	11.0	---	---	17.0	15.0	22.0	22.0	19.0	18.0	---	---
30	13.0	12.0	---	---	19.0	17.0	22.0	22.0	19.0	19.0	---	---
31	---	---	---	---	---	---	22.0	22.0	19.0	18.0	---	---
MONTH	10.0	9.0	---	---	---	---	22.0	22.0	22.0	21.0	---	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IOWA

LOCATION.--Lat 41°41'50", long 93°40'05", near center of sec.5, T.79 N., R.24 W., Polk County, at gaging station at bridge on County Road W, 2.0 miles west of Saylorville, 2.0 miles downstream from Rock Creek, 2.2 miles upstream from Beaver Creek and at mile 211.4.

DRAINAGE AREA.--5,841 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1961 to September 1968.
Sediment records: October 1961 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 33.0°C Aug. 20; minimum, freezing point on many days during December to March.
Sediment concentrations: Maximum daily, 1,850 mg/l June 25; minimum daily, 10 mg/l Nov. 2.
Sediment loads: Maximum daily, 18,800 tons June 30; minimum daily, 3 tons Feb. 23.

Period of record:

Water temperatures: Maximum, 34.0°C July 22, 1964; minimum, freezing point on many days during winter periods.
Sediment concentrations: Maximum daily, 4,760 mg/l June 12, 1966; minimum daily, 1 mg/l Jan. 8, 1965.
Sediment loads: Maximum daily, 148,000 tons June 12, 1966; minimum daily, 1 ton Jan. 8, 1965, Feb. 8-12, 23, 1967.

REMARKS.--Maximum observed concentration during water year. 2,250 mg/l June 25. Flow affected by ice Nov. 26 to Dec. 1, Dec. 3, 6, 8-10, 15-17, Dec. 20 to Mar. 7.

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C) DECEMBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP
1			--	1000	1040	970	720	650	710	550	620	--
2			--	--	1010	970	720	650	700	620	700	--
3			--	--	1000	970	720	600	720	650	650	750
4			--	--	940	950	720	610	750	700	610	710
5			--	--	940	930	720	600	750	720	610	--
6			870	--	900	830	730	620	750	--	580	690
7			860	--	890	810	740	650	--	720	550	720
8			880	--	920	690	740	650	--	720	--	--
9			870	--	--	660	730	640	--	680	510	690
10			870	--	--	690	750	650	--	680	590	620
11			800	1250	--	700	760	640	--	510	580	680
12			790	--	--	730	800	650	--	520	550	660
13			780	--	--	730	790	670	--	440	580	660
14			800	1110	--	730	790	650	--	--	580	680
15			830	1230	--	730	--	--	--	510	590	660
16			830	1250	1010	700	750	700	--	500	600	670
17			870	1260	1010	--	780	700	--	510	620	--
18			870	1290	1010	--	750	700	--	510	--	--
19			800	1350	1000	660	750	700	--	520	670	670
20			810	1350	940	650	730	700	--	440	700	--
21			810	1350	970	620	730	710	--	510	720	--
22			870	1320	1040	620	740	710	--	600	720	700
23			900	--	1010	620	580	710	--	650	720	700
24			900	--	1040	620	600	710	--	650	710	700
25			910	1320	1020	650	--	--	--	660	720	680
26			940	1300	1020	650	690	705	--	640	--	700
27			900	--	1000	700	740	410	--	550	710	700
28			900	--	1010	680	670	710	580	550	720	740
29			1000	--	--	--	660	720	510	580	730	720
30			980	1080	--	720	650	720	520	660	--	730
31			1000	1070	--	--	--	--	--	640	--	--
AVERAGE			870	1240	990	740	720	670	--	590	640	690

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.0	0	2.0	---	---	22.0	---	23.0	26.0	---
2	21.0	---	2.0	---	1.0	---	---	23.0	---	23.0	26.0	---
3	20.0	---	2.0	---	2.0	---	---	22.0	---	24.0	---	28.0
4	---	---	2.0	---	2.0	---	7.0	20.0	---	24.0	27.0	23.0
5	18.0	---	2.0	---	2.0	0	---	20.0	31.0	27.0	27.0	---
6	17.0	---	3.0	---	2.0	---	---	18.0	27.0	26.0	32.0	20.0
7	12.0	4.0	2.0	---	1.0	---	14.0	13.0	30.0	26.0	31.0	23.0
8	---	7.0	3.0	---	1.0	---	9.0	19.0	30.0	27.0	---	---
9	11.0	7.0	3.0	---	---	---	10.0	16.0	30.0	26.0	29.0	22.0
10	9.0	7.0	3.0	---	---	---	11.0	17.0	30.0	25.0	26.0	19.0
11	7.0	9.0	2.0	0	---	---	13.0	18.0	26.0	29.0	27.0	23.0
12	10.0	8.0	0	---	---	---	15.0	21.0	24.0	29.0	27.0	23.0
13	13.0	5.0	0	---	---	---	14.0	23.0	23.0	29.0	29.0	24.0
14	12.0	5.0	0	0	---	---	11.0	24.0	24.0	---	29.0	26.0
15	---	3.0	0	0	---	---	---	---	22.0	29.0	28.0	24.0
16	---	3.0	0	0	2.0	---	19.0	19.0	21.0	26.0	28.0	22.0
17	---	7.0	0	1.0	2.0	---	---	21.0	22.0	28.0	27.0	---
18	---	3.0	0	1.0	2.0	---	18.0	16.0	27.0	28.0	---	---
19	---	3.0	0	1.0	2.0	---	13.0	14.0	28.0	28.0	29.0	25.0
20	---	3.0	0	1.0	2.0	---	14.0	18.0	27.0	27.0	33.0	---
21	---	2.0	0	1.0	---	---	18.0	19.0	29.0	28.0	32.0	---
22	---	2.0	0	1.0	---	---	17.0	16.0	24.0	28.0	28.0	22.0
23	---	2.0	0	---	---	---	11.0	16.0	---	28.0	32.0	22.0
24	---	2.0	0	---	---	---	11.0	17.0	27.0	30.0	29.0	19.0
25	---	3.0	0	1.0	---	---	---	---	24.0	29.0	28.0	16.0
26	---	3.0	0	4.0	---	---	13.0	16.0	18.0	29.0	---	17.0
27	---	2.0	0	---	---	---	16.0	17.0	19.0	29.0	23.0	17.0
28	---	1.0	0	---	---	---	21.0	21.0	---	28.0	20.0	17.0
29	---	1.0	0	---	---	---	20.0	18.0	---	28.0	23.0	19.0
30	---	1.0	0	1.0	---	---	21.0	20.0	23.0	27.0	---	19.0
31	---	---	0	2.0	---	---	---	---	---	26.0	---	---
AVERAGE	---	4.0	1.0	---	---	---	---	18.5	---	27.0	28.0	---

DES MOINES RIVER BASIN

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	176	70	33	184	51	25	130	49	17
2	172	67	31	224	10	6	136	47	17
3	168	76	34	216	64	37	120	41	13
4	168	80	36	208	56	31	136	34	12
5	164	83	37	192	50	26	128	38	13
6	168	66	30	188	64	32	150	20	8
7	188	63	31	184	52	26	152	40	16
8	180	60	29	184	46	23	150	20	8
9	180	160	78	176	38	18	130	19	7
10	188	49	25	176	50	24	120	19	6
11	160	42	18	172	48	22	116	18	6
12	176	170	81	164	54	24	148	22	9
13	196	71	38	152	25	10	180	22	11
14	196	65	34	144	34	13	100	20	5
15	168	57	26	144	34	13	85	21	5
16	184	57	28	148	28	11	140	19	7
17	184	74	37	144	33	13	150	23	9
18	204	67	37	156	41	17	160	19	8
19	152	56	23	156	46	19	160	25	11
20	168	69	31	160	45	19	170	23	11
21	140	58	22	152	38	16	160	30	13
22	168	82	37	148	33	13	100	23	5
23	156	83	35	148	31	16	85	23	5
24	156	58	24	152	40	16	100	20	5
25	160	57	25	148	54	22	115	21	7
26	156	56	24	135	45	16	125	22	7
27	154	55	23	110	47	14	120	23	7
28	152	54	22	94	51	18	110	22	7
29	162	53	23	110	51	15	90	21	5
30	172	52	24	120	40	13	85	24	6
31	180	54	26	--	--	--	75	35	7
TOTAL	5296	--	1002	4789	--	563	3926	--	274
DAY	JANUARY			FEBRUARY			MARCH		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	72	28	5	155	54	23	90	25	6
2	66	--	5	160	50	22	95	26	7
3	62	--	5	170	50	23	86	24	6
4	58	--	5	175	47	22	110	25	7
5	54	--	4	170	30	14	135	23	8
6	51	--	4	165	28	12	170	16	7
7	48	--	4	160	51	22	210	75	43
8	46	--	4	150	24	10	256	24	17
9	45	--	4	140	--	11	265	70	50
10	44	--	4	130	--	11	278	71	53
11	45	30	4	125	--	10	260	49	34
12	46	40	5	120	--	10	238	27	17
13	48	40	5	115	--	9	260	22	15
14	53	91	13	110	--	9	247	20	13
15	60	41	7	105	--	9	283	32	24
16	63	32	5	100	36	10	260	72	51
17	64	33	6	96	42	6	270	70	51
18	65	31	5	92	21	5	292	60	47
19	66	36	6	88	30	7	310	50	42
20	70	33	6	88	23	5	292	59	47
21	76	40	8	100	15	4	256	24	17
22	86	48	11	105	13	4	242	23	15
23	92	30	7	90	13	3	238	19	12
24	98	25	7	90	15	4	220	34	20
25	103	23	6	95	15	4	208	38	21
26	105	24	7	90	15	4	200	49	26
27	108	25	7	87	30	7	242	61	40
28	114	30	9	86	24	6	212	63	36
29	120	45	15	85	24	6	212	65	37
30	140	47	18	--	--	--	216	68	40
31	150	50	20	--	--	--	220	50	30
TOTAL	2318	--	221	3442	--	292	6873	--	839

06481850 DES MOINES RIVER NEAR SAYLORVILLE, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	229	47	29	708	180	340	306	72	59
2	204	42	23	666	190	340	278	72	54
3	212	50	29	570	160	250	278	66	50
4	301	91	74	537	160	230	278	72	54
5	216	260	150	476	120	150	252	57	39
6	229	83	51	360	130	130	247	64	43
7	220	110	65	380	81	83	238	74	48
8	196	71	38	400	100	110	188	73	37
9	176	70	33	365	80	79	192	71	37
10	176	76	36	370	95	95	270	98	71
11	196	83	44	340	91	84	570	500	770
12	200	91	49	330	90	80	520	940	1320
13	164	92	41	296	96	77	360	480	470
14	184	80	40	390	190	200	184	900	1910
15	200	90	49	350	160	150	526	1600	2270
16	216	100	58	310	120	100	972	750	1970
17	256	120	83	330	67	60	998	490	1320
18	240	160	110	292	100	79	849	440	1010
19	270	120	87	283	72	55	920	410	1020
20	350	130	120	278	97	73	953	340	870
21	330	180	160	265	77	55	868	310	730
22	370	140	140	252	61	42	786	280	590
23	992	1250	3350	247	56	37	690	260	480
24	1130	1050	3200	242	65	42	588	240	380
25	1060	430	1230	250	66	45	1460	1850	7290
26	1020	270	740	260	67	47	2130	1690	9720
27	972	230	600	278	49	37	2320	1050	6580
28	979	240	630	260	63	44	3450	1460	13600
29	901	230	560	288	74	58	4050	1520	16600
30	842	220	500	270	69	50	4550	1530	18800
31	--	--	--	290	70	55	--	--	--
TOTAL	13051	--	12319	10933	--	3277	30873	--	88192
DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS)
1	3940	860	9150	1840	400	1990	275	65	48
2	3280	590	5190	1750	310	1460	270	60	44
3	2920	500	3940	1540	270	1120	260	60	42
4	2690	470	3410	1320	230	820	345	150	140
5	2410	410	2670	1250	220	740	365	140	140
6	2220	360	2160	1100	220	650	385	140	150
7	2040	300	1650	1000	310	570	410	120	130
8	1530	270	1120	1060	400	1140	350	110	100
9	1430	220	850	1130	730	2230	296	92	74
10	1180	190	610	1020	240	660	315	190	160
11	1060	200	570	849	200	460	355	120	120
12	1000	170	460	810	180	390	288	98	76
13	1180	200	640	732	130	260	283	94	72
14	1000	180	490	660	110	200	252	84	57
15	823	170	380	642	110	190	238	87	56
16	720	160	310	612	120	200	230	73	45
17	708	240	460	542	140	200	224	80	48
18	816	330	730	520	120	170	270	110	80
19	2210	980	5850	510	100	140	320	130	110
20	3690	1060	10600	445	100	120	340	140	130
21	2860	440	4400	410	100	110	360	150	150
22	2220	310	2640	385	110	110	370	160	160
23	1890	250	1580	340	81	74	385	160	170
24	1510	240	1020	350	290	270	380	170	170
25	1380	890	890	325	89	78	390	150	160
26	1150	210	680	330	78	69	405	150	160
27	1000	170	570	335	68	62	515	180	250
28	849	250	390	301	78	63	816	340	750
29	1240	410	840	288	70	54	1040	280	790
30	1400	310	1550	285	70	54	1100	290	860
31	1860	1560	1560	280	70	53	--	--	--
TOTAL	54186	--	67360	22961	--	14707	11832	--	5442
TOTAL DISCHARGE FOR YEAR (CFS DAYS)									170480
TOTAL LOAD FOR YEAR (TONS)									194488

DES MOINES RIVER BASIN

05487980 WHITE BREAST CREEK NEAR DALLAS, IOWA

LOCATION.--Lat 41°14'45", long 93°15'50", in NE¼NW¼ sec.3, T.74 N., R.21 W., at gaging station at county highway bridge, 0.5 mile downstream from Kirk Branch, and 2.2 miles northwest of Dallas.

DRAINAGE AREA.--342 sq mi.

PERIOD OF RECORD.--Water temperatures: October 1967 to September 1968.

Sediment records: October 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 27.0°C June 24, Aug. 23; minimum, freezing point on many days during November to March.

Sediment concentrations: Maximum daily, 8,180 mg/l Apr. 17; minimum daily, 5 mg/l Feb. 28.

Sediment loads: Maximum daily, 68,400 tons Apr. 23; minimum daily, less than 0.05 ton Jan. 16, Feb. 28, Sept. 26-29.

REMARKS.--Maximum observed concentration during water year, 9,400 mg/l Apr. 17. Flow affected by ice Nov. 26 to Mar. 14.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	0	0	0	0	10.0	16.0	19.0	25.0	21.0	---
2	---	---	0	0	0	0	13.0	15.0	24.0	---	21.0	---
3	---	4.0	0	0	0	0	9.0	17.0	22.0	---	22.0	20.0
4	---	4.0	1.0	0	0	1.0	8.0	14.0	23.0	---	22.0	19.0
5	---	4.0	0	0	0	0	6.0	13.0	23.0	---	24.0	19.0
6	---	3.0	2.0	0	0	0	6.0	15.0	24.0	---	26.0	17.0
7	---	3.0	2.0	0	0	0	10.0	13.0	24.0	---	26.0	19.0
8	---	3.0	3.0	0	0	---	4.0	12.0	24.0	---	26.0	18.0
9	---	4.0	3.0	0	0	---	6.0	12.0	26.0	---	26.0	18.0
10	---	5.0	3.0	0	0	---	9.0	13.0	26.0	---	23.0	18.0
11	---	6.0	3.0	0	0	0	9.0	14.0	18.0	---	21.0	17.0
12	---	9.0	2.0	0	0	0	13.0	17.0	17.0	---	20.0	16.0
13	---	6.0	1.0	0	0	0	14.0	17.0	18.0	---	20.0	16.0
14	---	5.0	0	0	0	2.0	11.0	21.0	18.0	---	22.0	16.0
15	---	3.0	0	0	0	2.0	12.0	22.0	18.0	---	22.0	18.0
16	---	3.0	0	0	0	4.0	13.0	19.0	21.0	---	23.0	---
17	---	4.0	0	0	0	6.0	10.0	18.0	20.0	---	23.0	17.0
18	---	4.0	0	0	0	6.0	13.0	18.0	18.0	---	22.0	16.0
19	---	4.0	0	0	0	9.0	14.0	13.0	22.0	---	22.0	17.0
20	---	4.0	2.0	0	0	6.0	12.0	12.0	23.0	---	23.0	14.0
21	---	4.0	0	0	0	3.0	12.0	13.0	26.0	---	26.0	16.0
22	---	4.0	0	0	0	1.0	13.0	12.0	26.0	---	26.0	16.0
23	---	4.0	0	0	0	0	9.0	12.0	26.0	---	27.0	18.0
24	---	4.0	0	0	0	4.0	7.0	14.0	27.0	---	24.0	17.0
25	---	4.0	0	0	0	6.0	8.0	16.0	26.0	---	24.0	14.0
26	---	4.0	0	0	0	11.0	7.0	15.0	19.0	24.0	22.0	14.0
27	---	2.0	0	0	0	11.0	10.0	13.0	18.0	23.0	19.0	13.0
28	---	0	0	0	0	14.0	14.0	13.0	---	22.0	19.0	14.0
29	---	0	0	0	0	15.0	12.0	15.0	---	22.0	19.0	16.0
30	---	0	0	0	---	15.0	13.0	16.0	---	24.0	19.0	14.0
31	---	---	0	0	0	12.0	---	15.0	---	22.0	---	---
AVERAGE	---	3.5	0.5	0	0	4.5	10.0	15.0	22.0	---	22.5	16.5

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE-SIZE, APRIL TO JULY 1968
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPENSED; D, DECATANTION;
N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEM- PER- ATURE (C)	DISCHARGE (CFS)	SUSPENDED- SEDIMENT		CONCENTRATION										METHOD OF ANALY- SIS	
				DISCHARGE (MG/L)	DISCHARGE (TONS/DAY)	.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00		2.00
APR. 4	1300	8	122	3410	1120	64	85	95	97	99	100	--	--	--	--	--	SPWC
APR. 4	1300	8	122	3410	1120	15	68	76	96	97	100	--	--	--	--	--	SPN
APR. 17	0800	13	276	10100	7590	49	64	76	86	95	100	--	--	--	--	--	SPWC
APR. 23	0800	9	6470	2940	51400	51	56	63	72	85	92	97	100	--	--	--	VPWC
JUNE 11	0800	18	440	3040	3610	75	86	87	91	91	100	--	--	--	--	--	SPWC
JULY 24	1220	24	74	7770	1550	57	66	83	91	--	100	--	--	--	--	--	SPWC

DES MOINES RIVER BASIN

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05487980 WHITE BREAST CREEK NEAR DALLAS, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(WHERE NO DAILY CONCENTRATIONS ARE REPORTED, LOADS ARE ESTIMATED)

DAY	OCTOBER			NOVEMBER			DECEMBER		
	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	TONS PER DAY
1	2.2	24	0.1	26	180	13	7.8	9	0.2
2	2.0	23	.1	24	140	9.1	8.6	8	.2
3	1.7	13	.1	25	35	2.4	9.6	17	.4
4	2.1	100	S5.4	25	35	2.4	7.8	18	.4
5	4.1	340	S4.4	16	99	4.3	7.0	40	.8
6	3.2	100	.9	14	64	2.4	8.6	15	.3
7	3.9	110	1.2	12	52	1.7	10	19	.5
8	3.5	47	.4	11	55	1.6	11	18	.5
9	3.6	48	.5	11	48	1.4	10	22	.6
10	4.2	37	.4	11	58	1.7	11	21	.6
11	2.9	36	.3	12	60	1.9	12	19	.6
12	2.6	62	.4	12	66	2.1	13	20	.7
13	2.6	71	.5	11	65	1.9	11	24	.7
14	4.1	100	B1.1	11	63	1.9	9.6	30	.8
15	13	390	S20	11	55	1.6	8.8	20	.5
16	29	690	S75	11	38	1.1	9.2	26	.6
17	32	590	S61	12	31	1.0	10	20	.5
18	13	340	B12	12	28	.8	11	17	.5
19	9.5	290	7.4	12	30	1.0	12	20	.6
20	7.8	290	6.1	12	22	.7	14	21	.8
21	7.9	180	4.1	12	19	.6	16	47	2.0
22	16	190	8.2	12	19	.6	19	57	2.9
23	16	120	5.2	13	20	.7	11	56	1.7
24	13	110	3.9	12	26	.8	8.6	56	1.3
25	6.3	120	2.0	12	11	.4	6.8	27	.5
26	6.3	110	1.9	12	14	.5	7.8	26	.5
27	6.9	94	1.8	9.6	10	.3	7.0	22	.4
28	6.6	27	.5	8.0	11	.2	6.4	17	.3
29	8.5	80	1.8	9.0	10	.2	6.8	21	.4
30	36	560	S75	7.0	8	.2	7.2	21	.4
31	24	320	21	--	--	--	7.8	22	.5
TOTAL	294.5	--	322.7	397.6	--	58.5	306.4	--	21.7
JANUARY									
1	9.0	24	0.6	76	140	29	4.0	6	0.1
2	7.2	20	.4	64	140	24	4.5	49	.6
3	5.8	27	.4	54	130	19	5.0	43	.6
4	4.5	20	.2	46	160	20	5.6	39	.6
5	3.5	24	.2	40	52	5.6	8.0	22	.5
6	2.7	31	.2	33	60	5.3	12	50	1.6
7	2.1	33	.2	28	69	5.2	16	46	2.0
8	1.6	46	.2	23	110	6.8	20	200	11
9	1.2	51	.2	19	49	2.5	25	400	27
10	.90	70	.2	16	86	3.7	18	500	24
11	.70	84	.2	13	14	.5	13	490	17
12	.54	47	.1	11	14	.4	9.0	460	11
13	4.40	60	.1	9.0	12	.3	8.2	450	10
14	.40	54	.1	7.6	13	.3	18	160	6.9
15	.40	50	.1	6.4	15	.3	21	170	9.6
16	.40	44	T	5.2	23	.3	19	180	8.2
17	1.1	45	.1	4.4	69	.8	19	97	5.0
18	2.5	87	.6	3.6	31	.3	21	120	6.8
19	5.4	66	1.0	3.0	14	.1	26	100	7.0
20	9.0	500	12	2.8	22	.2	22	84	5.0
21	12	300	9.7	2.7	26	.2	17	75	3.4
22	15	120	4.9	2.7	20	.1	15	83	3.4
23	18	150	7.3	2.7	15	.1	14	21	.8
24	22	110	6.5	2.7	19	.1	13	34	1.2
25	30	100	8.1	2.7	13	.1	14	29	1.1
26	45	83	10	2.8	21	.2	14	36	1.4
27	70	71	13	3.0	22	.2	14	40	1.5
28	110	87	26	3.4	5	T	14	43	1.6
29	140	240	91	3.8	7	.1	13	120	4.2
30	110	240	71	--	--	--	12	87	2.8
31	92	360	89	--	--	--	12	100	3.2
TOTAL	723.34	--	353.6	491.5	--	125.8	444.3	--	179.1

B COMPUTED FROM ESTIMATED CONCENTRATION GRAPH.

S COMPUTED BY SUBDIVIDING DAY.

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05487980 WHITE BREAST CREEK NEAR DALLAS, IOWA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(WHERE NO DAILY CONCENTRATIONS ARE REPORTED, LOADS ARE ESTIMATED)

DAY	APRIL			MAY			JUNE		
	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY	MEAN DIS-CHARGE (CFS)	MEAN CONCENTRATION (MG/L)	TONS PER DAY
1	14	83	3.1	85	180	41	19	57	2.9
2	19	35	1.8	71	180	34	15	67	2.7
3	35	1080	S240	59	170	27	9.4	77	2.0
4	89	4390	S1130	48	86	11	7.6	130	2.7
5	105	2100	S680	42	100	11	5.8	130	2.0
6	45	550	S67	38	63	6.5	4.5	130	1.6
7	31	420	35	38	140	14	3.7	180	1.8
8	28	410	31	44	130	15	3.2	190	1.6
9	24	440	29	37	280	28	2.8	240	1.8
10	22	340	20	31	47	3.9	40	1230	S800
11	22	310	18	29	54	4.2	293	7720	S7440
12	21	290	16	27	51	3.7	273	7090	S5120
13	21	140	7.9	24	58	3.8	67	2100	380
14	45	1350	S230	54	120	17	28	1500	110
15	32	200	17	53	66	9.4	15	370	15
16	38	1000	100	74	11	2.2	11	380	11
17	182	8180	S4110	40	170	18	9.2	380	9.4
18	80	1100	240	23	61	3.8	7.9	160	3.4
19	66	700	120	18	210	10	6.9	150	2.8
20	432	4450	S5570	14	74	2.8	5.9	100	1.6
21	505	4110	S6310	13	76	2.7	5.4	96	1.4
22	327	1530	4180	13	68	2.4	4.7	110	1.4
23	5640	4870	S63400	15	55	2.2	4.1	82	.9
24	4070	2900	31900	17	61	2.8	3.8	88	.9
25	1510	2300	9380	13	61	2.1	3.8	88	.9
26	352	1400	B1330	21	62	3.5	5.2	110	1.5
27	233	600	380	24	64	4.1	5.6	120	1.8
28	168	400	180	17	80	2.8	5.0	100	1.4
29	129	400	140	15	58	2.3	30	500	40
30	103	610	170	13	61	2.1	15	200	6.3
31	--	--	--	12	63	2.0	--	--	--
TOTAL	14388	--	130335.8	1022	--	295.3	910.5	--	13970.6
		JULY			AUGUST			SEPTEMBER	
1	9.2	180	4.0	9.5	130	.9	6.2	100	1.7
2	14	--	6.0	1.8	86	.4	2.5	50	.3
3	8.2	--	3.5	1.4	84	.3	1.3	31	.1
4	5.7	--	2.5	1.4	83	.3	2.3	31	.2
5	4.2	--	1.8	8.2	65	1.4	4.9	52	.7
6	11	--	5.9	7.8	68	1.4	1.7	64	.3
7	57	--	200	4.9	69	.9	1.1	72	.2
8	21	--	26	4.1	89	1.0	.79	63	.1
9	9.3	--	10	7.8	90	1.9	.75	60	.1
10	5.0	--	2.0	4.5	93	1.1	.81	53	.1
11	3.1	--	.8	2.8	93	.7	.68	56	.1
12	3.1	--	.8	1.8	90	.4	.53	150	.2
13	3.1	--	.8	2.5	90	.6	.39	110	.1
14	3.1	--	.8	2.3	68	.4	.39	87	.1
15	3.1	--	.8	1.4	75	.3	1.40	57	.1
16	18	--	29	1.4	81	.3	.37	54	.1
17	79	--	320	1.4	71	.3	.51	52	.1
18	41	--	100	1.2	72	.2	1.5	46	.2
19	32	--	35	.95	72	.2	.95	49	.1
20	13	--	7.0	.73	67	.1	.61	48	.1
21	6.4	--	3.5	.51	73	.1	1.6	45	.2
22	4.0	--	1.7	.51	67	.1	.98	46	.1
23	1.7	--	.23	.40	63	.1	.48	42	.1
24	98	1800	B480	.40	140	.2	.42	45	.1
25	18	600	B29	.62	72	.1	.31	65	.1
26	5.1	400	B5.5	.84	81	.2	.25	62	T
27	3.4	320	2.9	1.1	80	.2	.22	72	T
28	6.2	320	5.4	.73	190	.4	.12	67	T
29	5.2	300	4.2	.51	63	.1	.07	50	T
30	3.1	130	1.1	.62	67	.1	.08	53	T
31	2.5	130	.9	9.8	300	B7.9	--	--	--
TOTAL	512.0	--	1313.9	76.92	--	22.6	33.21	--	5.8
TOTAL DISCHARGE FOR THE YEAR (CFS DAYS)									19600.27
TOTAL LOADS FOR THE YEAR (TONS)									147005.4

B COMPUTED FROM PARTLY ESTIMATED CONCENTRATION GRAPH.

S COMPUTED BY SUBDIVIDING DAY.

T LESS THAN 0.05 TON.

DES MOINES RIVER BASIN

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05490600 DES MOINES RIVER AT ST. FRANCISVILLE, MO.

LOCATION.--Lat 40°27'45", long 91°34'00", Clark County, at bridge on County Highway B at St. Francisville, and 8 miles upstream from Sugar Creek.

PERIOD OF RECORD.--Chemical analyses: August to September 1967 (miscellaneous), October 1967 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SI02)	IRON (FE)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)
OCT. 17...	3570	6.6	.59	.04	31	8.5	6.6	5.0	100	0	39	6.4
NOV. 09...	1270	9.7	.04	.02	72	21	20	5.1	180	0	135	16
MAR. 06...	830	3.8	.08	.16	57	27	54	5.0	201	0	129	62
APR. 09...	1270	1.4	.06	.04	61	22	28	5.1	100	26	149	23
MAY 07...	1320	4.4	.03	.09	48	23	26	5.4	144	0	117	28
JUNE 18...	1350	.9	.05	.11	52	23	26	6.3	176	0	100	31
JULY 05...	4100	18	.00	.05	78	23	11	4.2	234	0	60	18
AUG. 06...	2700	1.3	.05	.04	44	22	23	4.1	156	0	80	26
SEPT. 19...	1190	.7	.06	.04	47	18	26	5.4	158	0	80	27

SPECIFIC CONDUCTANCE (MICROMHOS) PH COLOR CHEMICAL OXYGEN DEMAND DISSOLVED OXYGEN PERCENT SATURATION TURBIDITY TEMP-ERATURE (DEG C)

DATE	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR	CHEMICAL OXYGEN DEMAND	DISSOLVED OXYGEN	PERCENT SATURATION	TURBIDITY	TEMP-ERATURE (DEG C)
OCT. 17...	272	7.1	50	--	7.6	73	500	14
NOV. 09...	588	7.8	10	5.6	13.0	107	30	7
MAR. 06...	736	7.2	8	61	17.6	134	13	4
APR. 09...	635	9.2	5	46	13.0	131	32	16
MAY 07...	544	8.0	11	49	10.6	103	32	14
JUNE 18...	565	7.4	15	31	15.6	195	1.0	27
JULY 09...	636	7.9	18	20	7.2	91	84	28
AUG. 06...	508	7.6	8	38	14.8	200	20	32
SEPT. 19...	499	7.6	5	36	8.5	85	58	16

DATE	FLUORIDE (F)	NITRATE (NO3)	TOTAL PHOSPHORUS (PO4)	AMMONIA NITROGEN (N)	ORGANIC NITROGEN (N)	METHYLENE BLUE ACTIVE SUBSTANCE	DIS-SOLVED SOLIDS (PRE-SUE AT 180 C)	DIS-SOLVABLE SOLIDS (TENS PER AC-FT)	DIS-SOLVABLE SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	ALKALINITY AS CaCO3
OCT. 17...	.3	1.5	.31	--	--	.03	158	.21	1490	113	30	82
NOV. 09...	.4	3.7	.30	.00	.22	.05	369	.50	1270	266	119	148
MAR. 06...	.3	.1	1.5	.03	.92	.08	455	.62	1020	253	88	165
APR. 09...	.3	.5	.33	.02	.43	.04	396	.54	1760	243	126	125
MAY 07...	.3	.5	1.2	.01	.64	.04	366	.50	1900	215	96	118
JUNE 18...	.3	.8	.59	.03	1.1	.05	346	.47	1260	224	80	144
JULY 09...	.7	39	.16	.14	.90	.10	414	.56	4580	289	97	192
AUG. 06...	.6	4.2	.32	.04	1.8	.06	282	.38	1590	201	72	128
SEPT. 19...	.5	.2	.08	.14	.05	.05	288	.39	918	191	62	130

FOX RIVER BASIN

05495000 FOX RIVER AT WAYLAND, MO.

LOCATION.--Lat 40°23'45", long 91°35'50", in NW 1/4 sec. 31, T.65 N., R.6 W., Clark County, at gaging station on left bank 90 ft downstream from bridge on U.S. Highway 136, 0.8 mile west of Wayland, and 5 miles downstream from Brush Creek.

DRAINAGE AREA.--400 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: August to September 1967 (miscellaneous), October 1967 to September 1968.

DATE	DIS-CHARGE (CFS)	SILICA (SI02)	IRON (FE)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)
OCT. 17...	332	9.1	.34	.06	26	6.2	10	6.6	86	0	30	10
NOV. 09...	123	13	.11	.10	55	13	12	4.7	152	0	78	5.9
MAR. 06...	37	6.0	.34	.28	74	18	21	3.8	199	0	125	7.8
APR. 09...	108	9.4	.07	.09	62	14	14	4.6	165	0	104	5.6
MAY 07...	51	6.9	.00	.13	78	20	19	4.2	244	0	109	6.6
JUNE 18...	12	7.6	.05	.30	78	17	18	5.4	257	0	84	8.1
JULY 09...	4.9	2.8	.08	.54	66	16	23	6.2	242	0	66	12
AUG. 06...	6.6	4.7	.14	.35	60	13	15	5.2	200	0	63	7.0
SEPT. 18...	25	4.4	.21	.44	55	17	42	8.9	258	0	61	23

FOX RIVER BASIN

05495000 FOX RIVER AT WAYLAND, MO.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	FLUORIDE (F)	NITRATE (NO3)	TOTAL PHOSPHORUS (PO4)	AMMONIA NITROGEN (N)	ORGANIC NITROGEN (N)	METHYLENE BLUE ACTIVE SUBSTANCE	DISSOLVED OXYGEN	PERCENT SATURATION	TURBIDITY	TEMPERATURE (DEG C)	NON-CARBONATE HARDNESS (CA, MG)	ALKALINITY AS CaCO3
OCT. 17...	.4	.6	.23	--	--	.02	161	.22	144	90	20	71
NOV. 09...	.2	3.4	.12	.00	.10	.04	247	.34	82.0	191	66	125
MAR. 06...	.2	.0	.22	1.3	.56	.06	354	.48	35.4	259	96	163
APR. 09...	.1	.0	.06	.09	.80	.04	307	.42	89.5	212	77	135
MAY 07...	.2	.4	.95	.23	.16	.02	394	.54	54.3	277	76	200
JUNE 18...	.2	1.4	.23	.13	.84	.04	364	.50	11.8	265	54	211
JULY 09...	.4	.2	.22	.15	1.3	.05	322	.44	4.26	231	32	198
AUG. 06...	.4	1.6	.21	.03	1.2	.05	274	.37	4.88	203	39	164
SEPT. 18...	.4	.3	1.2	.00	1.5	.07	347	.47	23.4	207	0	212

SALT RIVER BASIN

05508000 SALT RIVER NEAR NEW LONDON, MO.

LOCATION.--Lat 39°36'44", long 91°24'30", in NE1/4 sec.36, T.56 N., R.5 W., Balls County, at gaging station on left bank 180 ft upstream from upstream bridge on dual U.S. Highway 61, 2 miles north of New London, 8 miles upstream from Spencer Creek, and at mile 35.8.

DRAINAGE AREA.--2,480 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: August to September 1967 (miscellaneous), October 1967 to September 1968.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DISCHARGE (CFS)	SILICA (SIQ2)	IRON (FE)	MANGANESE (MN)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (HC03)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)
OCT. 16...	2260	6.8	.57	.06	26	4.4	8.6	6.5	88	0	24	6.6
NOV. 09...	714	9.9	.43	.13	34	6.2	8.0	4.9	96	0	44	6.9
MAR. 07...	170	10	.72	.68	78	14	19	3.8	214	0	95	14
APR. 09...	475	5.8	.23	.13	51	10	18	4.4	135	0	86	10
MAY 07...	136	5.3	.02	.17	53	10	18	4.5	156	0	60	13
JUNE 18...	769	2.2	.20	.18	29	5.3	7.4	4.8	83	0	29	7.0
JULY 09...	151	8.0	.85	.15	30	5.3	8.2	5.6	92	0	28	12
AUG. 06...	24500	4.7	.66	.24	12	2.4	2.7	3.8	41	0	10	3.5
SEPT. 19...	440	4.7	.18	.11	51	8.5	12	4.8	156	0	46	14

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR	CHEMICAL OXYGEN DEMAND	DISSOLVED OXYGEN	PERCENT SATURATION	TURBIDITY	TEMPERATURE (DEG C)
OCT. 16...	217	7.1	32	--	7.5	72	18.0	14
NOV. 09...	260	7.5	41	3.6	11.0	86	13.0	5
MAR. 07...	558	7.6	2	11	13.4	106	1.0	6
APR. 09...	421	7.6	11	27	9.0	83	29	12
MAY 07...	431	8.0	15	28	11.2	114	8.0	17
JUNE 18...	234	7.0	125	51	5.8	67	29	23
JULY 09...	234	7.3	100	20	6.0	73	170	26
AUG. 06...	97	7.0	40	28	4.1	40	204	24
SEPT. 19...	383	7.8	4	19	8.4	88	15	18

SALT RIVER BASIN

05508000 SALT RIVER NEAR NEW LONDON, MO.--Continued

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	FLUO- RIDE (F)	NITRATE (NO3)	TOTAL PHOS- PHORUS (PO4)	AMMCNIA NITRO- GEN (N)	ORGANIC NITRO- GEN (N)	METHY- LENE BLUE ACTIVE SUB- STANCE	DIS- SOLVED SOLIDS (RESI- DUCE AT 180 C)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (Ca.MG)	NON- CAR- BONATE HARD- NESS	ALKA- LINITY AS CaCO3
OCT. 16...	.4	1.5	.28	--	--	.04	137	.19	836	83	11	72
NOV. 09...	.2	2.4	.38	.06	.04	.04	166	.23	320	111	32	79
MAR. 07...	.2	2.2	.02	.08	.44	.06	342	.47	157	252	76	176
APR. 09...	.1	.6	.09	.00	.27	.04	259	.35	332	168	58	111
MAY 07...	.2	.4	.25	.22	.47	.03	277	.38	102	173	45	128
JUNE 18...	.2	4.2	.40	.21	.95	.02	211	.29	438	94	26	68
JULY 02...	.2	2.7	.01	.32	.83	.06	191	.26	77.9	97	22	75
AUG. 06...	.2	1.7	.32	.03	1.4	.03	66	.09	4370	40	6	34
SEPT. 19...	.4	.2	.11	.00	.43	.04	233	.32	277	162	34	128

ILLINOIS RIVER BASIN

05540500 DU PAGE RIVER AT SHOREWOOD, ILL.

LOCATION,--Lat 41°31'20", long 88°11'35", in SE1/4 sec.10, T.35 N., R.9 E., Will County, temperature recorder at gaging station on left bank at Shorewood, 400 ft upstream from U.S. Highway 52, 3.8 miles downstream from Lily Cache Creek, and at mile 10.6.

DRAINAGE AREA,--325 sq mi.

PERIOD OF RECORD,--Water temperatures: October 1963 to September 1968.

EXTREMES,--1967-68:

Water temperatures: Maximum, 33.0°C Aug. 7; minimum, freezing point Jan. 8-31, Feb. 3-5.

Period of record:

Water temperatures: Maximum, 36.0°C July 23, 24, 1965, July 10, 25, 1966; minimum, freezing point on many days during winter periods.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

MONTH	DAY																															AVER- AGE	
	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		
OCTOBER																																	
MAXIMUM	19	22	23	24	24	19	17	14	14	13	11	13	13	17	16	16	16	14	13	12	12	13	14	14	13	10	8	8	8	10	10	14	
MINIMUM	14	18	19	21	19	17	14	14	13	11	11	9	12	12	16	16	14	13	11	11	10	11	12	13	10	8	7	7	8	8	10	12	
NOVEMBER																																	
MAXIMUM	10	10	10	9	8	7	7	7	7	7	9	9	9	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3	--	6	
MINIMUM	10	10	9	8	7	7	7	7	7	7	7	9	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	3	3	3	--	6	
DECEMBER																																	
MAXIMUM	3	3	3	3	4	6	6	6	6	6	6	6	6	6	4	3	3	4	4	6	7	7	3	3	3	3	3	3	3	3	3	4	
MINIMUM	3	3	3	3	3	4	6	6	6	6	6	6	6	6	4	3	3	3	3	4	4	3	3	3	3	3	3	3	3	3	3	4	
JANUARY																																	
MAXIMUM	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MINIMUM	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
FEBRUARY																																	
MAXIMUM	1	1	1	0	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	--	1	
MINIMUM	1	1	0	0	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	--	1		
MARCH																																	
MAXIMUM	1	1	1	1	1	2	4	4	3	3	4	4	1	2	4	8	9	9	8	8	7	6	4	7	9	12	13	13	13	13	6		
MINIMUM	1	1	1	1	1	1	2	3	3	3	3	1	1	1	2	4	6	7	8	7	6	4	3	3	6	8	11	11	12	11	10	4	
APRIL																																	
MAXIMUM	11	10	8	12	9	10	12	12	13	14	15	16	16	16	14	14	13	12	12	14	17	19	19	12	11	13	16	16	17	19	--	13	
MINIMUM	7	8	8	9	8	9	10	11	10	12	13	16	12	10	12	12	12	12	12	14	15	12	9	9	11	12	14	14	16	--	11		
MAY																																	
MAXIMUM	19	20	20	19	17	18	18	21	20	17	17	20	21	21	21	16	14	14	14	16	16	18	18	17	17	16	18	17	16	15	16	19	17
MINIMUM	16	16	18	16	12	12	13	17	18	14	14	16	17	19	21	16	13	14	13	13	14	15	16	14	17	16	16	15	14	14	16	15	
JUNE																																	
MAXIMUM	19	20	25	26	28	27	29	31	31	30	30	26	26	26	27	26	26	24	26	26	27	28	28	26	24	21	19	17	19	24	--	25	
MINIMUM	19	18	19	21	24	24	26	26	27	26	26	22	19	21	23	19	21	21	21	22	24	23	24	21	19	17	17	17	17	19	--	21	
JULY																																	
MAXIMUM	24	24	23	23	25	26	26	27	24	26	28	28	30	29	30	29	26	27	26	28	28	24	26	24	26	24	26	24	26	25	25	26	
MINIMUM	24	22	19	21	21	22	23	23	24	21	20	23	24	24	24	24	24	24	23	21	22	24	22	22	23	23	22	21	22	23	22	22	
AUGUST																																	
MAXIMUM	27	26	24	30	28	32	33	31	28	28	26	26	27	28	26	30	26	21	24	26	27	28	28	26	28	26	22	20	21	20	20	26	
MINIMUM	23	18	21	24	24	25	28	27	23	23	19	19	20	22	21	23	21	21	21	24	26	26	26	26	26	21	19	17	16	18	19	21	21
SEPTEMBER																																	
MAXIMUM	20	21	26	23	24	23	21	22	22	19	21	23	24	24	24	22	22	20	22	23	24	24	23	22	22	21	21	22	22	--	22		
MINIMUM	18	17	19	21	20	18	17	19	19	17	15	17	19	20	20	21	21	20	17	16	19	22	23	22	19	17	17	17	18	18	--	18	

ILLINOIS RIVER BASIN

05541500 ILLINOIS RIVER AT DRESDEN ISLAND, ILL.

LOCATION.--Lat 41°23'53", long 88°18'45", in SE¼NW¼ sec.28, T.34 N., R.8 E., on downstream side of Dresden Island navigation dam, 1.5 miles below the confluence of Des Plaines River and Kanawee River.

DRAINAGE AREA.--6,480 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: June 1967 to September 1988.

EXTREMES.--1967-68:

Water temperatures: Maximum, 33.0°C Aug. 7; minimum freezing point on many days in December.

Period of record:

Water temperatures: Maximum, 33.0°C Aug. 7, 1968; minimum, freezing point on many days in December 1967.

TEMPERATURE (°C) OF WATER, JUNE TO SEPTEMBER 1967

DAY	APR		MAY		JUN		JUL		AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	19.0	18.5	28.0	26.0	30.0	28.5	24.0	22.5
2	--	--	--	--	20.0	19.0	28.0	27.0	30.5	29.5	25.0	23.5
3	--	--	--	--	22.5	20.0	27.0	25.5	30.0	29.0	24.5	24.0
4	--	--	--	--	23.5	22.5	25.5	24.0	29.0	28.5	24.5	23.5
5	--	--	--	--	24.0	23.5	25.5	24.0	30.0	28.5	25.0	24.0
6	--	--	--	--	24.0	23.0	25.0	23.5	30.0	29.0	25.5	24.0
7	--	--	--	--	25.5	23.5	26.0	24.0	29.0	27.5	25.5	24.5
8	--	--	--	--	--	--	27.5	26.0	29.0	27.5	27.0	25.0
9	--	--	--	--	--	--	27.5	26.5	29.0	28.0	26.5	25.0
10	--	--	--	--	--	--	28.5	27.0	28.5	27.0	25.0	23.5
11	--	--	--	--	--	--	30.0	27.5	27.5	26.0	24.0	23.0
12	--	--	--	--	--	--	30.0	29.0	27.5	26.5	25.0	23.0
13	--	--	--	--	--	--	29.0	26.0	27.5	26.0	26.0	24.5
14	--	--	--	--	27.0	26.0	27.0	25.5	27.0	26.5	26.5	25.0
15	--	--	--	--	27.5	27.0	26.5	25.5	27.0	25.0	26.0	25.0
16	--	--	--	--	28.5	27.5	27.5	25.5	27.0	26.0	27.0	25.0
17	--	--	--	--	28.0	26.5	27.0	26.5	28.0	27.0	27.0	26.0
18	--	--	--	--	26.5	26.0	27.5	27.0	28.0	26.5	27.0	26.0
19	--	--	--	--	26.0	25.0	28.5	27.0	27.0	26.5	27.5	26.0
20	--	--	--	--	27.5	25.5	28.5	27.0	25.0	24.0	27.0	27.0
21	--	--	--	--	27.5	25.0	30.0	28.0	24.5	23.5	28.0	25.0
22	--	--	--	--	25.0	24.0	30.5	29.5	24.5	23.5	25.0	24.0
23	--	--	--	--	25.5	24.5	30.0	28.5	25.5	23.5	25.0	24.0
24	--	--	--	--	26.0	24.5	29.0	28.0	26.0	24.5	24.0	22.0
25	--	--	--	--	25.5	24.0	30.5	29.0	27.0	25.0	23.0	22.0
26	--	--	--	--	25.0	24.0	31.0	30.0	27.5	26.0	22.5	22.0
27	--	--	--	--	25.0	24.0	30.0	28.0	27.0	23.0	22.0	20.0
28	--	--	--	--	25.0	25.0	29.0	28.0	24.5	23.0	20.0	18.0
29	--	--	--	--	26.0	25.0	29.5	28.0	26.5	24.0	18.0	17.0
30	--	--	--	--	27.0	25.0	29.5	27.5	26.5	24.0	19.0	17.0
31	--	--	--	--	--	--	29.0	28.0	24.0	22.5	--	--
AVG	--	--	--	--	25.2	24.1	28.3	26.8	27.4	25.9	24.7	23.3

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT		NOV		DEC		JAN		FEB		MAR	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	20.0	18.0	12.5	11.5	5.0	3.0	--	--	--	--	5.0	3.0
2	21.0	20.0	12.0	10.0	6.0	4.0	--	--	--	--	4.5	3.0
3	22.0	20.0	10.5	9.5	6.0	4.5	--	--	--	--	4.5	2.5
4	23.0	21.5	9.5	8.5	5.0	3.0	--	--	--	--	4.5	3.0
5	23.0	22.0	8.5	6.5	5.5	3.0	--	--	--	--	4.5	2.5
6	22.0	21.0	6.5	5.5	6.0	5.0	--	--	--	--	4.0	2.5
7	21.0	19.5	7.5	6.0	6.0	5.0	--	--	--	--	5.0	3.5
8	21.0	19.0	8.0	6.0	6.0	5.0	--	--	--	--	8.5	3.5
9	19.0	17.0	9.0	7.0	7.0	5.0	--	--	--	--	9.5	7.5
10	17.0	16.5	10.0	8.0	7.5	5.0	--	--	--	--	10.5	8.0
11	17.0	16.0	11.5	10.0	6.0	3.0	--	--	--	--	9.0	7.0
12	16.0	15.0	12.0	10.0	5.0	2.5	--	--	--	--	7.0	5.5
13	16.0	15.0	10.0	7.5	3.0	2.5	--	--	--	--	6.5	4.5
14	18.5	16.0	9.0	7.5	2.5	1.5	--	--	--	--	6.5	4.5
15	18.5	17.5	8.0	7.0	1.5	0.0	--	--	--	--	7.0	5.0
16	18.0	15.5	7.5	5.5	1.0	0.0	--	--	--	--	8.0	6.0
17	16.0	15.0	10.0	7.0	1.0	.5	--	--	--	--	8.5	7.5
18	15.5	15.0	8.0	7.5	1.5	.5	--	--	--	--	10.5	7.5
19	15.0	13.5	8.5	7.0	2.0	1.0	--	--	--	--	10.0	9.0
20	15.0	14.0	7.5	5.5	3.0	1.5	--	--	--	--	10.0	9.0
21	15.0	14.0	7.5	6.0	5.0	2.5	--	--	--	--	9.0	7.5
22	15.0	14.0	8.0	7.0	2.5	0.0	--	--	--	--	8.0	6.0
23	15.0	14.0	7.5	6.0	1.0	0.0	--	--	--	--	7.0	5.0
24	16.5	15.0	8.0	6.5	1.0	0.0	--	--	--	--	6.5	5.0
25	16.0	13.0	9.0	6.0	0.0	0.0	--	--	--	--	7.0	5.5
26	13.0	12.0	8.5	7.0	0.0	0.0	--	--	--	--	11.0	7.0
27	13.0	12.0	8.0	5.5	--	--	--	--	--	--	12.5	11.0
28	13.0	12.0	5.5	3.0	0.0	0.0	--	--	5.0	3.0	15.0	12.5
29	12.0	10.0	5.0	3.5	0.0	0.0	--	--	5.0	3.0	16.0	13.5
30	12.0	10.0	5.0	3.5	1.0	0.0	--	--	--	--	16.0	13.0
31	12.0	11.5	--	--	--	--	--	--	--	--	16.5	15.0
AVG	17.0	15.6	8.6	6.9	3.3	2.0	--	--	--	--	8.6	6.6

05541500 ILLINOIS RIVER AT DRESDEN ISLAND, ILL.--Continued
TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APR		MAY		JUN		JUL		AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	15.0	13.0	19.0	18.5	20.5	18.5	22.5	22.0	27.5	27.0	24.0	25.0
2	15.0	13.5	20.0	18.5	20.5	20.0	23.0	22.0	28.5	27.5	25.5	24.5
3	18.0	13.5	20.0	19.0	21.0	20.0	23.5	22.0	30.0	28.0	26.0	25.0
4	18.0	10.5	20.5	19.0	23.5	21.0	23.5	22.5	30.0	30.0	27.0	26.0
5	10.5	8.5	19.5	18.0	25.0	23.5	24.0	22.5	30.5	30.0	27.5	26.0
6	9.0	8.0	18.0	17.5	26.0	24.0	25.0	23.5	31.5	30.0	26.0	25.0
7	10.0	8.5	18.5	17.0	27.5	26.0	25.0	25.0	33.0	31.0	25.5	25.0
8	10.0	9.0	21.5	18.5	29.0	27.0	25.0	24.0	32.5	31.0	25.5	25.0
9	11.5	10.0	22.0	19.0	30.0	28.5	26.0	24.0	31.0	30.0	25.5	24.0
10	13.0	11.5	21.5	18.5	29.0	28.0	28.0	25.0	31.0	29.5	24.0	23.5
11	14.0	12.0	21.0	18.5	29.0	28.0	26.0	24.5	29.5	27.5	25.0	23.5
12	14.5	13.0	21.5	20.0	28.5	27.0	28.0	25.5	28.0	27.0	25.5	24.0
13	15.0	14.0	20.5	20.0	27.0	26.0	29.0	27.0	29.0	27.0	26.0	24.5
14	16.5	14.0	23.0	20.5	27.5	26.0	24.0	28.0	30.0	28.0	27.0	25.5
15	14.0	12.5	22.0	21.5	27.0	26.0	29.0	28.0	29.0	27.5	26.5	26.0
16	14.0	13.0	22.0	18.5	26.5	25.0	30.0	28.5	30.0	28.5	26.0	25.5
17	17.0	14.0	18.5	17.5	26.5	24.5	31.5	30.0	30.0	27.0	25.5	24.5
18	15.5	14.0	18.0	17.0	26.0	24.0	31.0	29.5	27.0	25.0	24.0	23.0
19	15.0	14.0	17.5	15.0	26.5	25.5	31.0	28.5	25.5	25.0	25.0	23.0
20	15.0	13.5	16.0	14.5	26.0	25.0	31.0	29.5	27.0	25.5	24.0	22.0
21	16.5	15.0	17.0	15.0	27.5	26.0	31.0	30.0	29.0	27.0	25.0	23.0
22	18.0	16.5	18.0	17.0	28.0	27.0	31.0	30.0	30.0	29.0	25.0	24.5
23	18.5	16.0	17.5	16.0	28.5	27.5	30.5	29.0	31.0	30.0	25.0	24.0
24	18.0	12.0	17.0	16.0	29.0	27.0	31.0	29.0	31.0	30.0	26.0	24.0
25	12.5	11.0	18.0	16.5	27.5	21.5	29.5	28.5	30.0	27.5	25.5	24.0
26	15.0	12.5	17.0	16.5	21.5	20.0	30.5	28.5	27.5	27.0	24.0	23.5
27	17.0	15.0	17.0	16.0	20.0	19.0	30.0	29.0	27.0	26.0	25.0	24.0
28	18.0	16.0	17.0	15.5	18.5	17.5	29.5	28.5	27.0	26.0	24.5	23.5
29	17.5	16.5	17.5	17.0	20.0	18.0	29.0	28.0	27.0	25.5	24.5	23.0
30	19.0	17.5	17.5	16.5	27.0	20.0	28.5	27.5	27.5	25.0	23.0	22.0
31	--	--	19.0	17.5	--	--	28.5	27.5	26.0	25.0	--	--
AVG	14.9	12.9	19.1	17.6	25.5	23.8	28.0	26.6	29.1	27.7	25.3	24.2

ILLINOIS RIVER BASIN

05553700 ILLINOIS RIVER AT STARVED ROCK, ILL.

LOCATION.--Lat 41°19'29", long 88°59'02", in SW¼ sec.15, T.33 N., R.2 E., on upstream side of Starved Rock navigation lock and dam, 4.5 miles upstream from Vermillion River and 7.5 miles downstream from Fox River.

DRAINAGE AREA.--10,100 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: June 1967 to September 1968.

EXTREMES.--1967-68:

Water temperatures: Maximum, 31.0°C Aug. 8; minimum, freezing point on many days in January.

Period of record:

Water temperatures: Maximum 31.0°C Aug. 8, 1968; minimum, freezing point on many days in January 1968.

TEMPERATURE (°C) OF WATER, JUNE TO SEPTEMBER 1967

DAY	APR		MAY		JUN		JUL		AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	--	--	27.0	25.5	29.0	27.5	23.5	21.0
2	--	--	--	--	22.5	20.5	27.0	26.5	30.0	28.5	25.0	23.0
3	--	--	--	--	23.0	21.5	27.0	25.5	30.0	29.0	25.0	21.5
4	--	--	--	--	24.5	23.0	28.5	24.0	30.0	27.5	24.0	22.5
5	--	--	--	--	26.5	23.5	26.0	24.0	30.0	28.0	25.0	23.0
6	--	--	--	--	24.5	24.0	26.0	23.5	30.0	29.0	25.5	23.5
7	--	--	--	--	24.5	24.0	25.5	24.0	29.0	27.5	26.0	24.5
8	--	--	--	--	25.5	24.0	26.0	24.0	29.0	27.5	25.5	24.0
9	--	--	--	--	26.0	24.5	26.0	24.0	29.0	27.5	25.5	24.0
10	--	--	--	--	28.0	25.5	26.5	25.5	28.5	28.0	25.0	24.0
11	--	--	--	--	27.5	26.0	28.0	26.0	28.0	26.0	24.5	23.5
12	--	--	--	--	27.0	25.5	27.0	26.5	28.0	26.0	24.5	23.0
13	--	--	--	--	26.5	24.5	28.5	27.0	28.0	26.0	24.5	23.5
14	--	--	--	--	27.0	25.5	27.0	24.5	27.5	26.0	24.0	23.5
15	--	--	--	--	28.0	25.5	26.5	25.0	27.5	26.5	24.0	23.0
16	--	--	--	--	28.0	26.5	27.0	25.0	27.5	26.0	24.0	23.0
17	--	--	--	--	28.0	26.5	27.0	25.0	27.5	26.0	24.0	23.0
18	--	--	--	--	28.0	26.5	27.0	25.5	27.5	26.0	24.5	23.5
19	--	--	--	--	26.5	26.0	27.5	25.5	27.5	27.0	26.5	24.0
20	--	--	--	--	27.5	25.0	28.0	26.0	27.5	25.5	27.0	26.0
21	--	--	--	--	27.5	26.0	28.0	26.5	27.0	25.0	27.0	24.0
22	--	--	--	--	27.0	24.5	29.0	26.5	26.0	25.0	24.5	25.0
23	--	--	--	--	27.0	25.0	29.0	27.5	25.5	24.0	26.0	25.0
24	--	--	--	--	26.5	25.5	28.5	27.5	26.0	24.0	25.0	23.5
25	--	--	--	--	26.0	24.0	29.5	27.5	25.5	24.0	24.0	22.5
26	--	--	--	--	26.0	24.0	30.0	28.0	26.5	24.0	22.5	21.0
27	--	--	--	--	26.5	23.5	29.0	28.0	26.5	24.0	22.5	21.5
28	--	--	--	--	26.0	24.5	29.0	28.0	26.0	22.0	22.0	20.0
29	--	--	--	--	26.5	25.0	29.0	27.5	26.5	22.0	20.0	19.0
30	--	--	--	--	26.5	25.0	29.0	27.5	26.0	24.5	20.0	19.0
31	--	--	--	--	--	--	29.0	26.5	24.5	23.0	--	--
AVG	--	--	--	--	26.2	24.6	27.6	26.0	27.4	25.8	24.4	23.0

06553700 ILLINOIS RIVER AT STARVED ROCK, ILL.--Continued

DAY	TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968											
	OCT		NOV		DEC		JAN		FEB		MAR	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	19.5	18.5	14.0	12.5	6.5	6.0	1.0	0.0	--	--	3.0	1.5
2	20.0	18.5	14.0	13.0	7.0	6.5	1.0	0.0	--	--	4.0	3.0
3	21.0	19.0	13.0	11.0	7.0	7.0	--	--	--	--	4.0	3.0
4	22.0	20.5	11.0	10.0	7.0	6.5	--	--	--	--	4.0	2.0
5	22.5	22.0	10.0	9.0	7.5	6.5	--	--	--	--	4.0	2.5
6	22.5	21.5	9.0	7.5	8.5	7.5	--	--	--	--	5.0	3.0
7	21.5	20.5	--	--	8.5	8.5	--	--	--	--	5.5	3.5
8	21.5	19.5	--	--	8.5	8.5	--	--	--	--	5.0	4.0
9	19.5	18.5	--	--	9.5	8.5	--	--	--	--	5.0	4.0
10	18.5	17.0	10.0	9.0	9.5	8.5	--	--	--	--	5.5	5.0
11	17.5	17.0	11.0	10.0	9.0	8.5	--	--	--	--	7.0	5.5
12	17.5	16.5	11.5	11.0	9.0	8.0	--	--	--	--	6.5	5.5
13	16.5	15.5	11.5	10.5	9.5	8.0	--	--	--	--	6.5	5.0
14	17.5	15.5	10.5	10.0	8.5	8.0	--	--	--	--	6.0	5.0
15	18.0	17.0	11.0	10.0	8.0	6.0	--	--	--	--	6.0	5.0
16	18.0	17.5	10.0	9.5	6.0	5.0	--	--	--	--	7.0	5.5
17	18.5	18.0	9.5	9.0	6.0	5.5	--	--	--	--	8.0	6.0
18	18.5	17.0	9.5	9.0	6.0	5.0	--	--	--	--	8.0	7.0
19	17.0	16.0	10.0	9.0	6.5	6.0	--	--	--	--	10.0	8.0
20	16.0	15.0	10.0	8.5	7.5	6.5	--	--	--	--	10.0	10.0
21	15.0	14.0	9.0	8.5	8.5	7.5	--	--	--	--	10.0	8.5
22	15.0	14.0	9.5	9.0	8.5	6.5	--	--	--	--	8.5	8.0
23	15.0	14.0	9.0	8.0	6.5	5.0	--	--	--	--	--	--
24	16.0	15.0	8.5	8.0	5.0	5.0	--	--	--	--	--	--
25	15.5	14.0	9.0	8.0	5.0	4.5	--	--	--	--	7.5	6.0
26	15.0	14.0	9.5	8.5	5.0	4.0	--	--	--	--	9.0	6.5
27	14.0	13.5	8.5	7.0	4.5	3.0	--	--	2.5	2.5	11.0	8.5
28	13.5	12.5	7.0	6.0	3.0	2.0	--	--	3.0	2.5	12.0	10.0
29	12.5	12.0	7.0	6.0	2.5	1.5	--	--	3.0	2.5	13.5	11.5
30	12.5	12.5	7.0	6.5	2.0	.5	--	--	--	--	14.0	13.0
31	12.5	12.0	--	--	1.5	1.0	--	--	--	--	14.5	14.0
AVG	17.4	16.3	9.9	9.0	6.6	5.8	--	--	--	--	7.5	6.2
DAY	APR		MAY		JUN		JUL		AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	14.0	13.0	17.0	15.5	18.5	17.0	22.0	21.0	27.0	25.5	25.0	24.0
2	13.0	13.0	17.0	16.5	18.5	17.5	22.0	21.5	27.0	25.0	24.5	23.0
3	13.0	12.5	18.0	17.0	20.0	18.0	22.0	20.5	27.0	25.5	25.0	23.0
4	13.0	12.5	18.0	17.0	21.5	20.0	22.0	21.0	27.5	26.5	25.0	24.5
5	13.0	10.5	18.0	16.5	22.5	21.0	22.5	21.0	28.0	27.0	25.0	24.0
6	10.5	9.0	17.5	16.5	23.5	22.5	23.5	22.0	29.5	27.5	25.0	23.5
7	11.0	9.0	17.0	16.0	24.5	23.5	24.0	22.5	30.5	29.0	24.0	23.0
8	11.0	9.0	17.0	16.0	25.5	24.0	23.5	22.0	31.0	30.0	24.0	23.5
9	12.0	10.0	17.5	16.5	26.5	25.0	24.0	23.0	30.5	29.5	23.5	23.0
10	13.0	10.5	17.5	16.0	27.0	25.0	24.0	23.0	30.0	29.5	22.5	22.0
11	13.0	11.5	17.5	17.0	27.0	26.0	25.5	24.0	29.5	28.0	22.0	21.0
12	13.5	12.0	19.0	16.0	26.5	25.5	26.0	25.0	28.0	27.5	22.5	21.5
13	14.5	13.5	19.0	18.0	25.5	24.0	27.0	25.5	28.0	26.0	23.0	21.5
14	14.5	13.5	20.0	18.0	25.0	23.5	28.0	27.0	28.0	26.5	24.0	22.5
15	14.0	12.5	21.0	19.0	25.0	24.0	28.5	27.5	28.0	26.5	24.0	23.0
16	14.0	13.0	20.0	17.0	25.0	23.0	29.0	27.5	28.5	26.0	24.0	23.0
17	14.0	12.5	18.0	17.0	24.5	23.5	29.5	28.5	29.0	27.0	24.0	23.0
18	13.5	13.0	17.5	16.5	24.0	23.0	29.0	28.0	29.0	27.0	24.5	23.0
19	13.5	13.0	16.5	15.0	24.0	22.5	29.0	28.0	27.0	26.0	24.0	22.0
20	13.5	12.5	15.5	14.5	24.0	23.0	30.0	28.5	27.5	26.0	22.0	20.5
21	15.0	13.0	15.0	13.0	24.0	22.5	30.0	28.5	28.5	27.0	23.0	21.5
22	15.5	14.0	16.0	14.5	25.0	23.0	30.0	29.0	29.5	28.0	24.0	23.0
23	16.0	15.0	16.5	15.5	26.0	24.0	29.5	29.0	29.5	29.0	25.0	24.0
24	15.0	13.0	16.5	15.0	26.0	24.5	29.5	29.0	29.0	27.5	24.5	24.0
25	13.0	11.5	17.0	15.5	25.5	24.0	29.5	28.5	28.0	27.5	25.0	23.5
26	12.0	11.0	17.0	15.5	25.0	20.5	29.0	28.0	27.5	26.5	23.5	23.0
27	12.5	11.0	16.5	16.0	20.5	18.0	29.0	28.5	27.0	25.5	23.0	22.5
28	14.5	12.5	16.0	15.0	18.0	17.0	29.0	28.0	26.5	25.0	23.0	22.0
29	14.5	13.5	16.0	15.0	19.5	18.0	28.5	27.5	26.0	25.0	22.5	22.0
30	16.0	14.5	16.5	15.5	21.0	19.5	28.0	27.0	25.5	25.0	22.5	21.5
31	--	--	17.0	16.0	--	--	27.0	27.0	25.5	25.0	--	--
AVG	13.5	12.1	17.3	16.0	23.6	22.0	26.7	25.6	28.1	26.8	23.7	22.7

05585300 ILLINOIS RIVER AT LA GRANGE LOCK AND DAM, ILL.

LOCATION.--Lat 39°56'24", long 90°32'06", in sec.7, T.17 N., R.1 W., on right lock wall of La Grange navigation lock and dam, 5.2 miles downstream from La Moine River and at mile 80.2.

DRAINAGE AREA.--25,000 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: June to September 1968.

EXTREMES.--June to September 1968:

Water temperatures: Maximum, 30.0°C Aug. 23; minimum, 19.5°C June 29, Sept. 19,

DAY	APR		MAY		TEMPERATURE (°C) OF WATER, JUNE TO SEPTEMBER 1968				AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	--	--	23.0	22.0	25.5	24.5	23.5	23.0
2	--	--	--	--	--	--	23.5	22.5	25.0	24.5	23.5	23.0
3	--	--	--	--	--	--	23.5	22.5	25.0	24.5	24.0	23.0
4	--	--	--	--	--	--	23.5	22.5	--	--	23.5	23.0
5	--	--	--	--	--	--	24.0	22.5	26.5	--	23.5	23.0
6	--	--	--	--	--	--	24.0	23.0	27.5	26.5	23.0	22.5
7	--	--	--	--	--	--	24.5	23.5	28.0	27.0	23.5	22.5
8	--	--	--	--	--	--	25.0	23.5	29.0	28.0	22.5	22.0
9	--	--	--	--	--	--	25.0	24.0	29.0	28.5	22.0	21.0
10	--	--	--	--	--	--	25.0	24.0	29.0	27.5	21.0	20.5
11	--	--	--	--	--	--	25.0	24.0	27.5	26.5	21.0	20.5
12	--	--	--	--	--	--	25.5	24.5	26.5	26.0	21.0	20.0
13	--	--	--	--	--	--	26.0	24.5	26.5	26.0	21.0	20.0
14	--	--	--	--	--	--	26.0	25.0	27.0	26.0	21.5	20.5
15	--	--	--	--	--	--	26.5	25.5	26.5	26.0	21.5	20.5
16	--	--	--	--	--	--	27.5	26.5	27.0	26.0	21.0	21.0
17	--	--	--	--	--	--	27.5	27.0	27.0	26.5	21.0	20.5
18	--	--	--	--	--	--	27.5	26.5	27.5	26.5	20.5	20.0
19	--	--	--	--	--	--	28.0	27.0	28.5	27.5	20.0	19.5
20	--	--	--	--	--	--	28.0	27.0	28.5	27.5	20.5	20.0
21	--	--	--	--	--	--	28.0	27.0	28.5	27.5	21.0	20.5
22	--	--	--	--	--	--	28.0	27.5	29.5	28.0	21.0	20.5
23	--	--	--	--	--	--	28.5	28.0	30.0	29.0	21.0	21.0
24	--	--	--	--	--	--	28.5	28.0	29.5	29.0	21.0	21.0
25	--	--	--	--	--	--	28.0	27.5	29.0	28.0	21.0	21.0
26	--	--	--	--	--	--	27.5	27.0	28.0	27.5	21.5	20.5
27	--	--	--	--	--	--	27.5	26.5	27.5	26.5	21.5	20.0
28	--	--	--	--	--	21.0	26.5	26.0	26.5	25.5	21.0	20.5
29	--	--	--	--	--	21.0	27.0	26.0	25.5	24.5	21.0	20.5
30	--	--	--	--	--	22.0	26.5	26.0	24.5	24.0	21.0	20.5
31	--	--	--	--	--	--	26.5	25.5	24.0	23.5	--	--
AVG	--	--	--	--	--	--	26.1	25.2	27.3	26.5	21.6	21.0

MISSISSIPPI RIVER MAIN STEM

05587500 MISSISSIPPI RIVER AT ALTON, ILL.

LOCATION.--Lat 38°53'06", long 90°10'51", NE¼ sec.14, T.5 N., R.10 W., Madison County, near left bank on lock and dam 26 at Alton, 7.7 miles upstream from Missouri River and at mile 202.7 upstream from Ohio River.

DRAINAGE AREA.--171,500 sq mi, approximately.

PERIOD OF RECORD.--Water temperatures: June to September 1968.

EXTREMES.--June to September 1968:

Water temperatures: Maximum, 29.5°C July 23, 24, Aug. 22, 23; minimum, 20.0°C Sept. 20, 21, 22.

DAY	APR		MAY		TEMPERATURE (°C) OF WATER, JUNE TO SEPTEMBER 1968				AUG		SEP	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	--	--	--	--	--	--	24.5	24.0	26.5	26.0	26.0	25.0
2	--	--	--	--	--	--	24.5	23.5	26.5	25.5	25.5	25.0
3	--	--	--	--	--	--	24.5	24.0	26.0	25.0	25.5	25.0
4	--	--	--	--	--	--	25.0	24.0	26.0	25.0	25.5	25.0
5	--	--	--	--	--	--	25.0	24.0	26.0	25.0	25.0	24.5
6	--	--	--	--	--	--	25.0	24.0	27.0	26.0	24.5	24.0
7	--	--	--	--	--	--	25.5	24.5	28.0	27.0	24.5	24.0
8	--	--	--	--	--	--	26.0	24.0	28.0	27.5	24.0	23.0
9	--	--	--	--	--	--	25.5	25.0	29.0	28.0	23.5	22.5
10	--	--	--	--	--	--	25.0	25.0	29.0	28.5	22.5	21.5
11	--	--	--	--	--	--	25.5	25.0	28.5	27.5	22.0	21.0
12	--	--	--	--	--	--	26.0	25.5	27.5	26.5	22.0	21.0
13	--	--	--	--	--	--	26.5	26.0	26.5	26.5	22.0	21.0
14	--	--	--	--	--	--	26.5	26.0	27.0	26.5	22.0	21.0
15	--	--	--	--	--	--	26.0	25.5	27.0	26.5	22.0	21.0
16	--	--	--	--	--	--	27.0	26.0	27.5	26.5	22.0	21.5
17	--	--	--	--	--	--	28.0	26.5	28.0	27.0	21.5	21.0
18	--	--	--	--	--	--	27.5	27.0	28.0	27.0	21.5	20.5
19	--	--	--	--	--	--	27.5	26.5	28.5	27.5	21.0	20.5
20	--	--	--	--	--	--	28.5	27.0	29.0	28.0	20.5	20.0
21	--	--	--	--	--	--	29.0	27.5	29.0	28.5	21.0	20.0
22	--	--	--	--	--	--	29.0	28.0	29.5	28.5	21.5	20.0
23	--	--	--	--	--	--	29.5	28.5	29.5	29.0	21.5	20.5
24	--	--	--	--	--	--	29.5	28.5	29.0	29.0	21.0	21.0
25	--	--	--	--	--	--	29.0	28.0	--	--	21.0	20.5
26	--	--	--	--	--	--	28.0	27.5	--	--	21.0	20.5
27	--	--	--	--	--	--	28.0	27.5	28.5	27.5	21.0	20.1
28	--	--	--	--	--	--	28.0	27.0	27.5	26.5	21.0	20.5
29	--	--	--	--	--	--	27.5	27.0	27.0	26.0	21.0	20.5
30	--	--	--	--	--	24.5	27.5	26.5	26.0	25.5	21.5	20.5
31	--	--	--	--	--	--	27.0	26.5	26.0	25.5	--	--
AVG	--	--	--	--	--	--	26.8	25.9	27.6	26.8	22.4	21.7

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	DIS- CHARGE (CFS)	TEMP- ERATURE (DEG C)	SILICA (SI02)	TOTAL IRON (FE)	MAG- CAL- CIUM (CA)	NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	ALKA- LINITY AS CAC03	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
RED RIVER OF THE NORTH BASIN															
05033900 PELICAN RIVER AT DETROIT LAKES (LAT 46 48 37 LONG 095 49 42)															
AUG. 16	2.1	19	12	.04	69	33	9.2	3.7	357	0	293	32	5.6	.2	.2
SEP. 05	1.2	13	6.9	.05	57	34	9.2	4.4	330	0	271	26	6.0	.1	.1
SEP. 30	2.1	16	17	.02	79	35	8.1	4.2	384	0	315	34	5.8	.1	.1
05033940 PELICAN RIVER TRIBUTARY NEAR DETROIT LAKES (LAT 46 46 52 LONG 095 48 01)															
SEP. 30	.25	13	27	.04	75	34	6.7	3.2	382	0	313	13	11	.3	.3
05033960 SUCKER CREEK NEAR DETROIT LAKES (LAT 46 46 25 LONG 095 48 23)															
AUG. 14	1.1	15	23	.03	69	28	3.6	2.3	339	0	278	13	3.6	.2	1.2
SEP. 30	1.2	13	25	.05	75	28	3.5	2.8	358	0	294	12	3.6	.2	.3
05039100 PELICAN RIVER AT LAKE MELISSA OUTLET NEAR DETROIT LAKES (LAT 46 43 50 LONG 095 53 40)															
AUG. 16	12	19	11	.01	24	30	10	4.7	220	0	180	15	11	.2	.2
SEP. 05	5.7	18	13	.05	24	30	11	4.5	218	0	179	15	10	.1	1.0
05040500 PELICAN RIVER NEAR FERGUS FALLS (LAT 46 20 10 LONG 096 07 00)															
OCT. 25	13	--	6.6	.03	56	39	16	6.3	356	0	292	29	9.8	.3	.4
05062000 BUFFALO RIVER NEAR DILLWORTH (LAT 46 57 40 LONG 096 39 40)															
OCT. 24	21	--	17	.05	89	48	21	6.7	398	2	330	122	6.6	.3	.4
05064000 WILD RICE RIVER AT HENDRUM (LAT 47 16 05 LONG 096 47 50)															
OCT. 24	21	6	16	.15	71	34	20	4.7	348	5	294	54	5.8	.2	.3
05079000 RED LAKE RIVER AT CROOKSTON (LAT 47 46 32 LONG 096 36 30)															
DEC. 21	374	1	12	.03	56	21	6.5	3.8	258	0	212	33	3.6	.2	.4
APR. 09	929	6	10	.04	51	18	5.5	4.6	192	0	157	52	3.2	.1	1.0
JUNE 20	2030	26	13	.99	86	21	5.0	3.8	210	0	172	95	1.4	.2	.7
05087500 MIDDLE RIVER AT ARGYLE (LAT 48 20 27 LONG 096 49 02)															
APR. 10	14	12	10	.06	48	19	4.3	3.8	182	0	149	54	3.3	.2	1.9
SEP. 24	38	12	9.9	.08	83	39	7.3	3.7	356	0	292	79	6.2	.2	.0
05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON (LAT 48 43 50 LONG 096 39 50)															
OCT. 18	1.6	11	5.7	.06	60	28	7.7	3.8	294	0	241	35	5.2	.2	.4
SEP. 25	210	10	7.2	.13	68	27	7.0	3.7	262	0	215	67	4.8	.2	.2
05107500 ROSEAU RIVER AT ROSS (LAT 48 54 37 LONG 095 55 18)															
OCT. 19	22	9	4.6	.05	63	30	21	2.1	330	0	271	29	14	.4	.4
SEP. 25	673	11	14	.20	60	21	5.6	2.7	264	0	217	25	3.8	.3	.2
051129000 VERMILION RIVER BELOW VERMILION LAKE NEAR TOWER (LAT 47 57 41 LONG 092 28 33)															
OCT. 12	24	8	1.7	.03	7.9	1.9	1.6	.8	25	0	21	6.5	1.2	.1	.5
SEP. 19	512	18	.0	.05	7.5	2.0	1.4	.8	28	0	23	8.2	1.1	.1	.0
05132000 BIG FORK RIVER AT BIG FALLS (LAT 48 12 00 LONG 093 48 00)															
SEP. 12	449	11	9.7	.52	24	7.8	2.2	1.2	102	0	84	10	1.8	.3	1.9
05133500 RAINY RIVER AT MANITOU RAPIDS (LAT 48 38 04 LONG 093 54 47)															
APR. 29	13860	9	4.3	.29	15	.53	1.6	1.5	58	0	48	13	1.4	.2	1.5
05134200 RAPID RIVER NEAR BAUDETTE (LAT 48 32 10 LONG 094 33 45)															
OCT. 20	2.4	8	6.1	.05	65	26	12	2.1	293	0	240	50	3.0	.3	.3
SEP. 26	1070	11	9.2	.35	26	7.5	.6	1.3	106	0	87	9.7	1.1	.3	.9
05211000 MISSISSIPPI RIVER AT GRAND RAPIDS (LAT 47 13 56 LONG 093 31 48)															
OCT. 06	700	12	7.6	.03	34	15	7.0	2.1	181	0	148	7.2	1.6	.1	.4
DEC. 01	844	1	11	.04	37	15	7.7	2.4	200	0	184	12	2.0	.2	.3
MAY 01	50	10	15	.24	37	9.6	23	3.1	162	0	133	28	15	.2	.4
CROW WING RIVER BASIN															
05244000 CROW WING RIVER AT NIMROD (LAT 46 39 00 LONG 094 53 00)															
OCT. 31	389	4	8.9	.04	39	16	5.2	1.5	208	0	171	2.2	3.0	.1	.8
LEAF RIVER NEAR VERNDALE (LAT 46 29 23 LONG 095 00 27)															
OCT. 17	44	5	5.7	.03	65	23	6.0	1.9	304	0	249	13	3.6	.2	.2
WING RIVER NEAR VERNDALE (LAT 46 26 18 LONG 094 59 48)															
OCT. 16	22	8	14	.04	72	22	5.2	1.5	299	0	245	20	3.6	.1	8.4
REDEYE RIVER NEAR ALDRICH (LAT 46 29 55 LONG 094 54 30)															
OCT. 17	22	6	13	.03	66	20	7.0	1.7	302	0	248	5.2	3.0	.1	.2
PARTRIDGE RIVER NEAR ALDRICH (LAT 46 24 58 LONG 094 50 24)															
OCT. 17	5.1	8	9.8	.03	70	21	6.6	2.1	297	0	244	20	6.4	.2	3.1
05270500 SAUK RIVER NEAR ST. CLOUD (LAT 45 33 35 LONG 094 14 00)															
AUG. 29	39	19	9.0	.11	43	24	8.3	4.4	222	0	182	27	8.8	.2	2.5
05286000 RUM RIVER NEAR ST. FRANCIS (LAT 45 19 40 LONG 093 22 20)															
SEP. 05	327	19	9.9	.12	36	11	5.0	1.8	174	0	143	8.5	3.0	.2	.2

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHO PHOS- PHATE (PO4)	TOTAL PHOS- PHATE (PO4)	ALUM- INUM (AL)	BORON (B)	DIS- SOLVED OXYGEN (O2)	DIS- SOLVED SOLIDS (SUM OF TUENTS)	DIS- SOLVED SOLIDS (TONS AC-FT)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	NON- CAR- BONATE HARD- NESS (CA, MG)	SODIUM AD- SORP- TION RATIO	PER- CENT SODIUM	SPECI- FIC COND- UCTANCE (MICRO- MOS)	PH	COLOR
RED RIVER OF THE NORTH BASIN															
05033900 PELICAN RIVER AT DETROIT LAKES (LAT 46 48 37 LONG 095 49 42)															
AUG. 16	.24	.34	.4	.05	--	341	.47	1.96	309	16	.2	6	582	8.0	10
SEP. 05	.18	.27	.6	.06	--	308	.44	1.12	283	12	.2	7	544	8.1	10
SEP. 30	.14	.47	.8	.06	--	372	.51	2.17	340	25	.2	5	822	7.7	10
05033940 PELICAN RIVER TRIBUTARY NEAR DETROIT LAKES (LAT 46 46 52 LONG 095 48 01)															
SEP. 30	.11	.31	1.3	.06	--	381	.52	.26	328	15	.2	4	591	7.8	2
05033980 SUCKER CREEK NEAR DETROIT LAKES (LAT 46 48 25 LONG 095 48 23)															
AUG. 14	.12	.17	.4	.01	--	311	.43	.96	285	8	.1	3	516	8.2	5
SEP. 30	.12	.27	.6	.03	--	327	.45	1.07	302	9	.1	2	546	7.7	2
05039100 PELICAN RIVER AT LAKE MELISSA OUTLET NEAR DETROIT LAKES (LAT 46 48 50 LONG 095 53 40)															
AUG. 16	.14	.28	.5	.05	--	214	.30	7.53	182	2	.3	10	363	7.9	5
SEP. 05	.16	.26	.6	.05	--	217	.30	3.38	181	2	.4	11	377	7.9	3
05040500 PELICAN RIVER NEAR FERGUS FALLS (LAT 46 20 10 LONG 096 07 00)															
OCT. 25	--	.11	.4	.07	--	339	.48	12.9	300	8	.4	10	592	8.1	17
05062000 BUFFALO RIVER NEAR DILWORTH (LAT 46 57 40 LONG 096 39 40)															
OCT. 24	--	.18	.7	.12	--	510	.73	30.7	420	90	.4	10	800	8.4	20
05064000 WILD RICE RIVER AT HENDRUM (LAT 47 18 05 LONG 096 47 50)															
OCT. 24	--	.16	.7	.10	--	383	.54	23.5	317	23	.5	12	633	8.4	21
05079000 RED LAKE RIVER AT CROOKSTON (LAT 47 46 32 LONG 098 36 30)															
DEC. 21	.16	--	.4	.03	--	284	.42	309	226	14	.2	6	448	8.0	13
APR. 09	.17	--	.4	.03	--	241	.37	875	202	44	.2	5	399	7.5	26
JUNE 20	.00	--	.0	.07	--	311	.52	2080	251	79	.1	4	500	7.3	45
05087500 MIDDLE RIVER AT ARGYLE (LAT 48 20 27 LONG 096 49 02)															
APR. 10	.22	--	.4	.02	--	235	.34	10.1	199	50	.1	4	388	7.7	2
SEP. 24	.20	.73	.4	.06	--	403	.60	45.4	364	73	.2	4	840	8.2	45
05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON (LAT 48 43 50 LONG 096 39 50)															
OCT. 18	--	.43	.6	.05	--	292	.43	1.38	264	23	.2	6	505	7.5	37
SEP. 25	.12	.44	.4	.13	--	315	.47	197	260	88	.2	5	510	7.7	50
05107500 ROSEAU RIVER AT ROSS (LAT 48 54 37 LONG 095 55 18)															
OCT. 19	--	.10	.5	.06	--	327	.46	21.0	280	9	.5	14	572	7.6	32
SEP. 25	.41	.73	.4	.06	--	283	.41	554	235	19	.2	5	423	8.1	47
05129000 VERMILION RIVER BELOW VERMILION LAKE NEAR TOWER (LAT 47 57 41 LONG 092 28 33)															
OCT. 12	--	.09	.4	.01	--	35	.07	3.87	28	7	.1	11	63	6.5	22
SEP. 19	.13	.35	.3	.02	--	35	.09	87.1	27	4	.1	10	85	7.2	7
05132000 BIG FORK RIVER AT BIG FALLS (LAT 48 12 00 LONG 093 48 00)															
SEP. 12	.10	--	1.5	.06	--	111	.22	193	92	8	.1	5	170	6.5	130
05133500 RAINY RIVER AT MANITOU RAPIDS (LAT 48 38 04 LONG 093 54 47)															
APR. 29	.11	--	1.2	.02	--	74	.15	4190	60	12	.1	5	119	6.9	125
05134200 RAPID RIVER NEAR BAUDETTE (LAT 48 32 10 LONG 094 33 45)															
OCT. 20	--	.04	.5	.06	--	310	.46	2.20	269	29	.3	9	516	8.2	34
SEP. 26	.09	.45	.8	.06	--	110	.23	460	96	8	.0	1	168	7.6	170
05211000 MISSISSIPPI RIVER AT GRAND RAPIDS (LAT 47 13 56 LONG 093 31 48)															
OCT. 06	--	.10	.4	.03	--	165	.24	335	146	0	.3	9	295	7.7	7
DEC. 01	.22	--	.3	.02	--	187	.29	488	155	0	.3	10	330	7.8	8
MAY 01	1.1	--	.0	.06	--	212	.30	30.2	132	0	.9	27	382	7.0	30
CROW WING RIVER BASIN															
05244000 CROW WING RIVER AT NIMROD (LAT 46 39 00 LONG 094 53 00)															
OCT. 31	--	.09	.4	.02	--	179	.28	204	164	0	.2	6	332	7.7	24
LEAF RIVER NEAR VERNDALE (LAT 46 29 23 LONG 095 00 27)															
OCT. 17	--	.02	.7	.03	--	270	.39	34.7	256	7	.2	5	473	8.0	11
WING RIVER NEAR VERNDALE (LAT 46 26 18 LONG 094 59 46)															
OCT. 16	--	.01	.5	.03	--	294	.40	17.6	270	25	.1	4	500	7.8	11
REDEYE RIVER NEAR ALDRICH (LAT 46 29 55 LONG 094 54 30)															
OCT. 17	--	.12	.4	.02	--	285	.38	16.8	246	0	.2	6	462	7.8	12
PARTRIDGE RIVER NEAR ALDRICH (LAT 46 24 58 LONG 094 50 24)															
OCT. 17	--	.06	.4	.02	--	286	.39	3.94	261	17	.2	5	487	7.6	14
05270500 SAUK RIVER NEAR ST. CLOUD (LAT 45 33 35 LONG 094 14 00)															
AUG. 29	.29	--	1.6	.06	--	238	.34	26.9	204	22	.3	8	428	7.5	7
05286000 RUM RIVER NEAR ST. FRANCIS (LAT 45 19 40 LONG 093 22 20)															
SEP. 05	.33	--	.9	.04	--	163	.24	158	137	0	.2	7	292	7.7	9

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS- CHARGE (CFS)	TEMP- ERATURE (DEG C)	SILICA (SI02)	TOTAL IRON (FE)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	ALKA- LINITY AS CACOS	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
MINNESOTA RIVER BASIN															
05292000 MINNESOTA RIVER AT ORTONVILLE (LAT 45 17 44 LONG 096 26 38)															
OCT. 06	9.6	15	27	.01	91	51	51	12	259	0	212	288	25	.2	5.1
OCT. 06	9.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05304500 CHIPPEWA RIVER NEAR MILAN (LAT 45 06 39 LONG 095 47 57)															
OCT. 04	30	16	26	.14	83	55	30	10	296	0	243	238	7.6	.4	2.1
HAWK CREEK, 2 MILES UPSTREAM FROM CLARA CITY (LAT 44 58 12 LONG 095 21 40)															
OCT. 17	2.0	--	14	.42	115	86	27	5.4	341	0	280	397	5.6	.4	.2
CHETOMBA CREEK NEAR PRINSBURG (LAT 44 56 06 LONG 095 12 05)															
OCT. 17	.20	--	5.4	.06	140	108	110	13	215	0	178	745	26	.7	22
CHETOMBA CREEK, 4 MILES SOUTH OF MAYNARD (LAT 44 51 44 LONG 095 25 37)															
OCT. 17	1.2	--	8.1	.12	82	48	12	3.4	212	0	174	234	7.4	.2	.1
HAWK CREEK NEAR GRANITE FALLS (LAT 44 49 59 LONG 095 26 01)															
JUNE 12	--	21	19	.08	73	32	9.5	4.4	195	0	160	150	7.9	.4	15
JUNE 26	--	17	17	.10	75	44	23	8.2	257	0	211	164	26	.4	6.8
JULY 05	45	22	15	--	80	51	25	8.2	260	0	213	198	27	.5	4.0
HAWK CREEK, 3 MILES SOUTH OF MINNESOTA FALLS (LAT 44 45 41 LONG 095 25 43)															
OCT. 17	4.4	--	12	.34	115	88	88	8.9	307	0	252	358	17	.3	.2
WEST FORK BEAVER CREEK NEAR DANUBE (LAT 44 47 20 LONG 095 08 18)															
OCT. 17	--	--	21	.20	115	52	14	3.8	338	0	277	235	6.4	.3	.2
EAST FORK BEAVER CREEK NEAR OLIVIA (LAT 44 47 23 LONG 094 59 43)															
OCT. 17	2.0	--	15	.13	148	87	15	3.8	330	0	271	364	9.2	.4	.4
BEAVER CREEK, 2 MILES DOWNSTREAM FROM BEAVER FALLS (LAT 44 33 48 LONG 095 02 44)															
OCT. 17	3.2	--	14	.22	112	54	34	6.0	399	0	327	219	27	.4	1.5
BIRCH COULEE CREEK NEAR MORTON (LAT 44 32 30 LONG 094 87 12)															
OCT. 17	1.0	--	21	.17	128	56	20	5.8	409	0	335	239	4.4	.3	.2
COTTONWOOD RIVER NEAR AMIRET (LAT 44 18 12 LONG 095 41 39)															
SEP. 04	1.5	20	20	.04	205	77	50	9.3	280	0	230	700	4.6	.4	.0
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COTTONWOOD RIVER NEAR REVERE (LAT 44 16 45 LONG 095 22 11)															
SEP. 05	1.7	16	15	.04	165	77	47	8.3	287	0	235	567	9.8	.4	.2
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DUTCH CHARLEY CREEK NEAR LAMBERTON (LAT 44 13 21 LONG 095 13 46)															
SEP. 05	7.8	15	14	.03	133	51	30	6.5	308	0	253	346	12	.5	.0
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MOUND CREEK NEAR SPRINGFIELD (LAT 44 11 40 LONG 095 03 36)															
SEP. 05	3.2	19	17	.06	103	37	10	3.5	311	0	255	161	5.0	.3	.1
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COAL MINE CREEK NEAR SPRINGFIELD (LAT 44 13 28 LONG 095 01 55)															
SEP. 05	1.3	18	24	.03	133	64	19	7.4	382	0	313	302	11	.4	.0
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLEEPY EYE CREEK NEAR LEAVENWORTH (LAT 44 15 15 LONG 094 46 26)															
SEP. 06	18	14	19	.02	128	67	29	6.5	379	0	311	324	12	.4	2.0
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COTTONWOOD RIVER NEAR SLEEPY EYE (LAT 44 16 45 LONG 094 40 47)															
SEP. 06	66	18	19	.03	105	49	37	3.5	302	0	248	251	12	.3	1.9
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05317000 COTTONWOOD RIVER NEAR NEW ULM (LAT 44 17 40 LONG 094 26 40)															
DEC. 13	12	1	13	.04	111	50	42	5.4	403	0	331	209	18	.2	5.2
MAR. 19	120	1	10	.04	85	25	23	4.8	199	0	163	143	11	.3	5.1
JUNE 28	57	21	17	.09	94	42	23	6.2	221	0	181	288	11	.4	.4

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHO PHOS- PHATE (PO4)	TOTAL PHOS- PHATE (PO4)	ALUM- INUM (AL)	BORON SOLVED (B)	DIS- SOLVED OXYGEN (O ₂)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA, MG)	NON- CAR- BONATE HARD- NESS	SODIUM AD- SORP- TION RATIO	PER- CENT SODIUM	SPECI- FIC COND- UCTANCE (MICRO- MHO'S)	PH	COLOR
MINNESOTA RIVER BASIN															
05292000 MINNESOTA RIVER AT ORTONVILLE (LAT 45 17 44 LONG 096 26 38)															
OCT. 06	1.3	--	.6	.26	--	681	.99	18.9	437	225	1.1	20	982	8.2	8
OCT. 06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05304500 CHIPPEWA RIVER NEAR MILAN (LAT 45 06 39 LONG 095 47 57)															
OCT. 04	.36	--	.4	.19	--	599	.86	52.5	431	188	.6	13	877	7.7	12
HAWK CREEK, 2 MILES UPSTREAM FROM CLARA CITY (LAT 44 58 12 LONG 095 21 40)															
OCT. 17	--	.02	.8	.12	--	820	1.22	4.85	640	360	.5	8	1160	7.9	9
CHETOMBA CREEK NEAR PRINSBURG (LAT 44 56 06 LONG 095 12 05)															
OCT. 17	--	4.3	.6	.74	--	1280	1.94	.77	794	618	1.7	23	1710	7.4	11
CHETOMBA CREEK, 4 MILES SOUTH OF MAYNARD (LAT 44 51 44 LONG 095 25 37)															
OCT. 17	--	--	.5	.06	--	500	.77	1.84	402	228	.3	6	780	8.0	5
HAWK CREEK NEAR GRANITE FALLS (LAT 44 49 59 LONG 095 28 01)															
JUNE 12	.47	--	.8	.06	--	408	.59	--	311	151	.2	6	626	7.9	23
JUNE 26	.59	--	.6	.10	--	492	.72	--	366	155	.5	12	774	7.8	27
JULY 05	--	--	--	.09	--	537	.78	69.9	409	196	.5	11	840	7.4	10
HAWK CREEK, 3 MILES SOUTH OF MINNESOTA FALLS (LAT 44 45 41 LONG 095 25 43)															
OCT. 17	--	.02	.5	.16	--	766	1.12	9.81	566	314	.7	12	1100	7.9	8
WEST FORK BEAVER CREEK NEAR DANUBE (LAT 44 47 20 LONG 095 08 18)															
OCT. 17	--	.02	.4	.07	--	615	.89	--	501	224	.3	6	900	7.8	8
EAST FORK BEAVER CREEK NEAR OLIVIA (LAT 44 47 23 LONG 094 59 43)															
OCT. 17	--	.02	.4	.09	--	786	1.15	4.58	644	373	.3	5	1100	7.6	5
BEAVER CREEK, 2 MILES DOWNSTREAM FROM BEAVER FALLS (LAT 44 33 48 LONG 095 02 44)															
OCT. 17	--	.71	.5	.14	--	666	.94	6.00	502	175	.7	13	988	8.2	12
BIRCH COULEE CREEK NEAR MORTON (LAT 44 32 30 LONG 094 57 12)															
OCT. 17	--	.08	.4	.14	--	677	.98	1.94	550	214	.4	7	997	7.9	5
COTTONWOOD RIVER NEAR AMIRET (LAT 44 18 12 LONG 095 41 39)															
SEP. 04	.11	.41	.2	.35	10.0	1210	1.77	5.26	828	598	.8	11	1520	7.6	10
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COTTONWOOD RIVER NEAR REVERE (LAT 44 16 45 LONG 095 22 11)															
SEP. 05	.29	.40	.2	.28	7.1	1030	1.52	5.29	728	493	.8	12	1370	8.0	7
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DUTCH CHARLEY CREEK NEAR LAMBERTON (LAT 44 13 21 LONG 095 13 46)															
SEP. 05	.04	.33	.2	.19	8.9	744	1.09	17.0	538	286	.6	11	1070	7.8	7
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MOUND CREEK NEAR SPRINGFIELD (LAT 44 11 40 LONG 095 03 36)															
SEP. 05	.12	.54	.2	.18	12.0	492	.72	4.54	409	154	.2	5	758	7.9	3
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COAL MINE CREEK NEAR SPRINGFIELD (LAT 44 13 28 LONG 095 01 55)															
SEP. 05	.31	.41	.3	.11	9.2	748	1.11	3.01	592	279	.3	6	1080	7.9	10
MAR. 19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLEEPY EYE CREEK NEAR LEAVENWORTH (LAT 44 15 15 LONG 094 46 26)															
SEP. 06	.07	.20	.2	.14	8.7	774	1.14	40.8	592	281	.5	9	1110	7.9	3
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COTTONWOOD RIVER NEAR SLEEPY EYE (LAT 44 16 45 LONG 094 40 47)															
SEP. 06	.20	.29	.2	.13	12.8	628	.94	125	464	216	.7	15	969	8.1	2
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COTTONWOOD RIVER NEAR NEW ULM (LAT 44 17 40 LONG 094 26 40)															
DEC. 13	.46	--	.3	.15	--	653	.92	22.7	483	152	.8	16	997	7.8	4
MAR. 19	.37	--	.3	.12	--	385	.56	134	265	102	.6	16	812	7.5	8
JUNE 28	.71	--	.8	.14	--	563	.81	93.0	408	227	.5	11	835	7.9	12

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SI02)	TOTAL IRON (FE)	CAL- CIUM (CA)	MAG- NE SIUM (MG)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	ALKA- LINITY AS CACO3	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
MINNESOTA RIVER BASIN--Continued														
LITTLE COTTONWOOD RIVER NEAR LEAVENWORTH (LAT 44 10 19 LONG 094 47 55)														
SEP. 06	14	14	22	.01	133	41	12	3.5	342	0	281	212	8.4	3.1
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LITTLE COTTONWOOD RIVER NEAR CAMBRIA (LAT 44 14 13 LONG 094 21 39)														
SEP. 06	35	18	24	.05	109	35	10	4.1	331	0	271	140	8.4	3.0
MINNEOPA CREEK NEAR MANKATO (LAT 44 09 12 LONG 094 04 58)														
SEP. 06	--	14	7.6	.03	54	30	11	4.1	238	0	195	73	17	2.6
05320500 LE SUEUR RIVER NEAR RAPIDAN (LAT 44 06 40 LONG 094 02 28)														
OCT. 12	25	10	18	.04	95	34	38	6.7	420	0	344	87	18	.0
05326200 JUDICIAL DITCH 1-A NEAR NEW SWEDEN (LAT 45 25 00 LONG 094 15 00)														
DEC. 11	.01	1	10	.08	185	97	115	13	526	0	431	451	129	.3
MAR. 18	2.4	7	17	.10	95	43	92	12	284	0	233	248	105	.4
JUNE 24	3.0	21	17	.11	93	42	18	3.8	303	0	249	136	25	.5
MISSISSIPPI RIVER MAIN STEM														
05331000 MISSISSIPPI RIVER AT ST. PAUL (LAT 44 56 40 LONG 093 05 20)														
NOV. 06	2960	6	--	.02	--	--	--	--	--	--	--	--	--	--
JUNE 18	26300	21	--	.16	--	--	--	.0	--	--	--	--	--	--
ST. CROIX RIVER BASIN														
05336700 KETTLE RIVER BELOW SANDSTONE (LAT 46 23 24 LONG 092 52 56)														
JUNE 21	3030	19	8.4	.80	20	6.8	2.5	2.0	86	0	71	7.7	1.5	.3
CANNON RIVER BASIN														
05353800 STRAIGHT RIVER NEAR FARIBAULT (LAT 44 15 29 LONG 093 13 51)														
OCT. 30	51	4	3.5	.00	85	28	30	5.0	340	0	279	59	37	.3
ZUMBRO RIVER BASIN														
05373000 SOUTH FORK ZUMBRO RIVER NEAR ROCHESTER (LAT 44 04 00 LONG 092 27 55)														
OCT. 27	36	10	16	.05	80	22	63	6.7	279	0	229	48	81	.8
MISSISSIPPI RIVER MAIN STEM														
05378000 MISSISSIPPI RIVER AT WINONA (LAT 44 03 20 LONG 091 38 15)														
DEC. 18	10400	1	5.0	.01	36	14	12	2.1	168	0	138	19	9.2	.1
MAR. 20	21900	4	11	.03	35	14	13	3.0	179	0	147	6.5	11	.2
APR. 24	41400	8	8.4	.10	29	12	7.6	2.9	132	0	108	18	7.7	.2
JULY 01	73500	20	11	.21	29	10	5.0	2.1	118	0	97	21	5.0	.2
SEP. 20	20300	18	13	.00	38	13	7.2	2.4	156	0	188	27	7.4	.2
ROOT RIVER BASIN														
05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON (LAT 43 44 00 LONG 091 34 00)														
OCT. 26	74	7	12	.00	61	27	2.4	1.4	314	0	258	12	1.8	.2
IOWA RIVER BASIN														
05457000 CEDAR RIVER NEAR AUSTIN (LAT 43 38 10 LONG 092 58 20)														
OCT. 23	47	15	16	.01	70	24	75	4.6	286	1	236	37	106	.3
DES MOINES RIVER BASIN														
05476000 WEST FORK DES MOINES RIVER AT JACKSON (LAT 43 37 10 LONG 094 59 10)														
OCT. 13	11	9	6.3	.01	75	44	33	5.9	240	0	197	190	36	.5
DEC. 11	14	2	5.5	.00	111	55	44	5.4	346	0	284	235	44	.3
APR. 08	14	11	4.3	.05	51	34	48	4.8	174	0	143	140	60	.3
JULY 11	18	25	16	.05	89	38	26	6.3	245	0	201	182	29	.4
AUG. 20	90	22	9.0	.02	86	40	19	5.3	215	0	176	210	18	.4

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	ORTHO PHOS- PHATE (PO4)	TOTAL PHOS- PHATE (PO4)	ALUM- INUM (AL)	BORON (B)	DIS- SOLVED OXYGEN	(SUM OF CONSTI- TUENTS)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED SOLIDS (TONS PER DAY)	NON- CAR- BONATE HARD- NESS	SODIUM AD- TION RATIO	PER- CENT SODIUM	SPECTI- FIC COND- (MICRO- MBGS)	PH	COLOR
MINNESOTA RIVER BASIN--Continued															
LITTLE COTTONWOOD RIVER NEAR LEAVENWORTH (LAT 44 10 19 LONG 094 47 55)															
SEP. 06	.08	.22	.2	.47	--	604	.86	24.4	497	217	.2	5	884	7.9	2
SEP. 05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LITTLE COTTONWOOD RIVER NEAR CAMBRIA (LAT 44 14 13 LONG 094 21 39)															
SEP. 06	.21	.26	.3	.06	--	497	.71	49.4	414	143	.2	5	754	7.6	6
MINNEOPEA CREEK NEAR MANKATO (LAT 44 09 12 LONG 094 04 58)															
SEP. 06	.36	.40	.3	.06	--	317	.47	--	258	63	.3	8	538	7.5	10
05320500 LE SUEUR RIVER NEAR RAPIDAN (LAT 44 06 40 LONG 094 02 28)															
OCT. 12	.17	--	.3	.12	--	504	.89	35.0	375	30	.9	18	796	8.0	3
05326200 JUDICIAL DITCH 1-A NEAR NEW SWEDEN (LAT 45 25 00 LONG 094 15 00)															
DEC. 11	.62	--	.3	.13	--	1280	1.89	.04	861	430	1.7	22	1850	7.9	17
MAR. 18	3.3	--	.3	.14	--	759	1.09	5.37	413	180	2.0	32	1210	7.9	27
JUNE 24	.45	--	.7	.03	--	491	.71	4.21	401	152	.4	9	781	8.2	21
MISSISSIPPI RIVER MAIN STEM															
05331000 MISSISSIPPI RIVER AT ST. PAUL (LAT 44 56 40 LONG 093 05 20)															
NOV. 06	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--
JUNE 18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ST. CROIX RIVER BASIN															
05336700 KETTLE RIVER BELOW SANDSTONE (LAT 46 23 24 LONG 092 52 56)															
JUNE 21	--	--	1.3	.04	--	95	.18	1090	77	7	.1	6	152	7.9	100
CANNON RIVER BASIN															
05353800 STRAIGHT RIVER NEAR FARIBAULT (LAT 44 15 29 LONG 093 13 51)															
OCT. 30	1.9	--	.3	.11	--	419	.59	60.6	328	49	.7	16	676	8.2	10
ZUMBRO RIVER BASIN															
05373000 SOUTH FORK ZUMBRO RIVER NEAR ROCHESTER (LAT 44 04 00 LONG 092 27 55)															
OCT. 27	11	--	.6	.18	--	517	.72	52.0	288	59	1.6	31	833	8.2	12
MISSISSIPPI RIVER MAIN STEM															
05378500 MISSISSIPPI RIVER AT WINONA (LAT 44 03 20 LONG 091 38 15)															
DEC. 18	.42	--	.1	.04	--	182	.26	5390	148	10	.4	15	334	7.5	13
MAR. 20	.78	--	.3	.03	--	185	.28	12100	143	0	.5	16	348	7.8	18
APR. 24	.52	--	.7	.04	--	154	.23	18700	120	12	.3	12	276	7.6	12
JULY 01	.20	--	1.1	.05	--	146	.23	33700	114	17	.2	9	246	7.9	55
SEP. 20	.54	--	.7	.06	--	188	.28	11300	148	19	.3	9	324	7.3	10
ROOT RIVER BASIN															
05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON (LAT 43 44 00 LONG 091 34 00)															
OCT. 26	.11	--	.0	.00	--	276	.38	56.5	264	6	.1	2	481	7.8	5
IOWA RIVER BASIN															
05457000 CEDAR RIVER NEAR AUSTIN (LAT 43 38 10 LONG 092 58 20)															
OCT. 23	6.5	--	.7	.05	--	485	.73	68.6	274	38	2.0	37	881	8.3	6
DES MOINES RIVER BASIN															
05476000 WEST FORK DES MOINES RIVER AT JACKSON (LAT 43 37 10 LONG 094 59 10)															
OCT. 13	.62	--	.5	.10	--	511	.76	16.8	389	172	.7	16	809	7.9	11
DEC. 11	1.2	--	.3	.12	--	673	.98	28.2	501	217	.9	16	1040	8.0	8
APR. 08	.82	--	.8	.09	--	431	.83	18.1	266	123	1.3	28	747	7.5	5
JULY 11	.68	--	1.4	.08	--	514	.76	27.2	377	178	.6	13	810	7.6	5
AUG. 20	.85	--	.5	.09	--	495	.71	127	379	203	.4	10	773	7.7	5

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG./L.)	LOAD (TONS)	DATE	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG./L.)	LOAD (TONS)
RED RIVER OF THE NORTH BASIN							
05040500 PELICAN RIVER NEAR FERGUS FALLS							
DEC. 19, 1967	25	62	4.2	MAY 24, 1968	138	15	5.6
FEB. 1, 1968	2.1	13	.07	MAY 25	138	14	5.2
FEB. 20	1.1	3	.01	MAY 26	138	13	4.8
MAR. 19	10	7	.19	MAY 27	142	17	6.5
MAR. 30	82	47	10	MAY 28	142	17	6.5
APR. 6	97	31	8.1	MAY 29	145	14	5.5
APR. 7	108	36	10	MAY 30	142	14	5.4
APR. 8	138	38	14	MAY 31	149	14	5.6
APR. 9	142	26	10.0	JUNE 1	145	13	5.1
APR. 10	120	16	5.2	JUNE 2	138	10	3.7
APR. 11	108	18	5.2	JUNE 3	138	14	5.2
APR. 12	106	17	4.9	JUNE 4	135	17	6.2
APR. 13	104	16	4.5	JUNE 5	132	18	6.4
APR. 14	104	13	3.6	JUNE 6	142	16	6.1
APR. 15	101	14	3.8	JUNE 7	149	20	8.0
APR. 20	106	13	3.7	JUNE 8	160	28	12
APR. 21	120	13	4.2	JUNE 9	160	29	13
APR. 22	132	17	6.1	JUNE 10	174	32	15
APR. 23	150	20	8.6	JUNE 11	182	39	19
APR. 24	174	17	8.0	JUNE 12	178	40	19
APR. 25	163	19	8.4	JUNE 13	178	34	16
APR. 26	142	18	6.9	JUNE 14	167	28	13
APR. 27	132	15	5.3	JUNE 15	149	24	9.7
APR. 28	135	14	5.1	JUNE 16	142	19	7.3
APR. 29	135	14	5.1	JUNE 17	135	16	5.8
APR. 30	129	18	6.3	JUNE 18	128	14	4.8
MAY 1	129	19	6.6	JUNE 19	120	10	3.2
MAY 2	126	18	6.1	JUNE 20	117	15	4.7
MAY 3	123	18	6.0	JUNE 21	132	21	7.5
MAY 4	120	14	4.5	JUNE 22	145	15	7.4
MAY 5	117	18	5.7	JUNE 23	142	17	6.7
MAY 6	117	18	5.7	JUNE 24	135	13	4.7
MAY 7	117	14	4.4	JUNE 25	129	12	4.2
MAY 8	129	15	5.2	JUNE 26	126	11	3.7
MAY 9	138	16	6.0	JUNE 27	120	11	3.6
MAY 10	142	22	8.4	JUNE 28	117	11	3.5
MAY 11	145	20	7.8	JUNE 29	111	10	3.0
MAY 12	152	19	7.8	JUNE 30	114	11	3.4
MAY 13	149	22	8.8	JULY 1	111	14	4.2
MAY 14	170	23	11	JULY 2	108	19	5.5
MAY 15	186	25	13.7	JULY 3	108	12	3.5
MAY 16	145	17	6.7	JULY 4	104	6	1.7
MAY 23	142	16	6.1	JULY 25	88	5	1.2
				SEP. 4	49	2	.26
05087500 MIDDLE RIVER NEAR ARGYLE							
MAR. 25, 1968	20	10	.54	JUNE 24, 1968	72	22	4.3
MAR. 26	65	12	2.1	JUNE 25	66	19	3.4
MAR. 27	130	25	8.8	JUNE 26	64	18	3.1
MAR. 28	160	45	19	JUNE 27	62	19	3.2
MAR. 29	170	46	21	JUNE 28	55	19	2.8
MAR. 30	150	45	18	JUNE 29	47	20	2.9
MAR. 31	100	40	11	JUNE 30	43	25	2.9
APR. 1	60	32	5.2	JULY 1	43	22	2.6
APR. 2	40	17	1.8	JULY 2	41	30	3.3
APR. 3	32	11	.95	JULY 3	78	43	9.1
APR. 4	35	8	.76	JULY 4	196	43	23
APR. 5	40	6	.65	JULY 5	231	36	22
APR. 6	34	7	.64	JULY 6	189	27	14
APR. 7	26	9	.63	JULY 7	135	24	8.7
APR. 8	20	13	.70	JULY 8	98	21	5.6
APR. 9	17	18	.83	JULY 9	75	18	3.6
APR. 10	15	23	.93	JULY 10	61	19	3.1
APR. 11	13	25	.88	JULY 11	51	19	2.6
APR. 12	12	19	.62	JULY 12	45	16	1.9
APR. 13	11	11	.33	JULY 21	847	71	162
APR. 14	11	15	.45	JULY 22	579	61	95
APR. 15	12	16	.52	JULY 23	332	54	48
APR. 16	14	10	.38	JULY 24	254	42	29
APR. 17	13	8	.26	JULY 25	180	41	20
APR. 18	11	8	.24	JULY 26	139	39	15
APR. 19	10	10	.27	JULY 27	107	31	9.0
APR. 20	10	12	.32	JULY 28	91	25	6.1
APR. 21	11	11	.33	JULY 29	81	30	6.6
APR. 22	13	8	.28	JULY 30	71	36	6.9
APR. 23	17	13	.60	JULY 31	64	30	5.2
APR. 24	20	22	1.2				
APR. 25	22	15	.89	AUG. 1	58	33	5.2
APR. 26	19	16	.82	AUG. 2	54	32	4.7
APR. 27	15	18	.73	AUG. 3	52	29	4.1
APR. 28	10	14	.38	AUG. 4	48	29	4.4
APR. 29	7.0	10	.19	AUG. 5	42	31	3.5
APR. 30	5.5	8	.12	AUG. 6	38	28	2.9
MAY 1	4.8	12	.16	AUG. 7	34	31	2.8
MAY 2	4.2	13	.15	AUG. 8	32	39	3.4
MAY 3	4.0	12	.13	AUG. 9	29	37	2.9
MAY 4	3.8	12	.12	AUG. 10	25	53	3.6
MAY 5	3.8	11	.11	AUG. 11	23	38	2.4
MAY 6	4.5	11	.13	AUG. 12	21	46	2.6
MAY 7	4.7	7	.09	AUG. 13	19	47	2.4
MAY 8	4.3	15	.17	AUG. 20	16	39	1.7
MAY 9	3.7	14	.14	AUG. 26	30	68	5.5
MAY 10	4.0	16	.17	AUG. 27	29	59	4.6
				AUG. 28	30	59	4.8

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS)	DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS)
RED RIVER OF THE NORTH BASIN--Continued							
05087500 MIDDLE RIVER NEAR ARGYLE--Continued							
MAY 11, 1968	4.3	15	.17	AUG. 29, 1968	28	51	3.9
MAY 12	4.6	13	.16	AUG. 30	28	45	3.4
MAY 13	4.9	10	.13	AUG. 31	25	42	2.8
MAY 14	4.4	12	.14	SEP. 1	23	41	2.5
MAY 15	3.8	16	.16	SEP. 2	23	41	2.5
MAY 16	4.4	21	.25	SEP. 3	23	40	2.5
JUNE 9	95	93	27	SEP. 4	20	43	2.3
JUNE 10	280	120	91	SEP. 5	20	50	2.7
JUNE 11	502	136	184	SEP. 6	20	42	2.3
JUNE 12	655	113	200	SEP. 7	19	36	1.8
JUNE 13	847	125	286	SEP. 8	21	33	1.9
JUNE 14	1060	83	238	SEP. 9	20	31	1.7
JUNE 15	971	62	162	SEP. 10	23	39	2.4
JUNE 16	718	65	128	SEP. 11	29	38	2.8
JUNE 17	429	54	63	SEP. 12	28	36	2.7
JUNE 18	281	58	44	SEP. 13	26	33	2.3
JUNE 19	199	36	19	SEP. 14	25	35	2.4
JUNE 20	257	29	12	SEP. 15	21	38	2.2
JUNE 21	126	28	6.5	SEP. 16	20	31	1.7
JUNE 22	100	24	6.5	SEP. 24	40	54	5.8
JUNE 23	85	21	4.8	SEP. 25	36	70	6.8
CROW WING RIVER BASIN							
05244000 CROW WING RIVER AT NIMROD							
DEC. 18, 1967	425	20	23	JUNE 16, 1968	1660	27	121
JAN. 22, 1968	245	16	11	JUNE 17	1560	26	110
FEB. 19	245	3	2.0	JUNE 18	1420	26	100
MAR. 18	385	3	3.1	JUNE 19	1290	21	73
MAR. 26	480	19	25	JUNE 20	1220	22	72
MAR. 27	640	24	42	JUNE 21	1190	26	84
MAR. 28	760	26	53	JUNE 22	1120	25	76
MAR. 29	649	14	24	JUNE 23	1050	20	57
MAR. 30	862	14	25	JUNE 24	978	18	42
MAR. 31	649	12	21	JUNE 25	962	15	39
APR. 1	644	13	23	JUNE 26	926	15	38
APR. 2	816	12	20	JUNE 27	891	15	36
APR. 3	610	8	13	JUNE 28	800	15	34
APR. 4	598	11	18	JUNE 29	831	20	45
APR. 5	630	15	26	JUNE 30	850	27	62
APR. 6	604	15	24	JULY 1	955	19	49
APR. 7	649	14	25	JULY 2	919	10	25
APR. 8	766	31	31	JULY 3	870	10	23
APR. 9	818	18	40	JULY 4	824	9	20
APR. 10	812	14	31	JULY 5	805	9	20
APR. 11	805	16	35	JULY 6	772	9	19
APR. 12	798	21	45	JULY 7	746	9	18
APR. 13	792	18	34	JULY 8	727	8	16
APR. 14	798	15	32	JULY 9	688	10	19
APR. 15	818	20	44	JULY 10	668	12	22
APR. 16	820	20	44	JULY 11	642	12	20
APR. 17	810	16	35	JULY 12	864	14	33
APR. 18	766	14	29	JULY 13	844	9	20
APR. 19	740	15	30	JULY 14	827	9	20
APR. 20	790	15	32	JULY 15	1720	16	74
APR. 21	900	16	39	JULY 16	1550	10	42
APR. 22	970	19	50	JULY 17	1370	11	41
APR. 23	1060	21	60	JULY 18	1270	11	38
APR. 24	1170	24	76	JULY 19	1100	8	24
APR. 25	1150	27	84	JULY 20	948	11	28
APR. 26	1120	23	70	JULY 21	877	12	26
APR. 27	1060	20	57	JULY 22	838	9	20
APR. 28	1020	20	55	JULY 23	792	8	17
APR. 29	1000	25	68	JULY 24	753	8	16
APR. 30	955	22	57	JULY 25	714	8	15
MAY 1	842	21	52	JULY 26	682	9	17
MAY 2	870	24	56	JULY 27	662	9	16
MAY 3	857	23	53	JULY 28	636	9	15
MAY 4	838	26	59	JULY 29	616	8	13
MAY 5	824	18	40	JULY 30	616	7	12
MAY 6	805	25	54	JULY 31	616	5	8.3
MAY 7	818	24	53	AUG. 1	592	4	6.4
MAY 21	746	14	28	AUG. 2	568	5	7.7
MAY 22	714	18	35	AUG. 3	544	6	8.8
MAY 23	705	22	42	AUG. 4	532	7	10.7
MAY 24	727	23	45	AUG. 5	508	8	11
MAY 25	670	22	40	AUG. 6	490	4	5.3
MAY 26	642	21	36	AUG. 7	484	5	6.5
MAY 27	640	17	29	AUG. 8	502	4	5.4
MAY 28	642	13	23	AUG. 9	490	4	5.3
MAY 29	600	13	21	AUG. 10	484	3	3.9
MAY 30	598	17	27	AUG. 11	472	2	2.5
MAY 31	600	19	31	AUG. 12	466	5	6.3
JUNE 1	610	17	28	AUG. 13	454	5	6.1
JUNE 2	600	16	26	AUG. 14	442	5	6.0
JUNE 3	699	17	27	AUG. 15	454	4	4.9
JUNE 4	600	17	28	AUG. 20	484	5	6.5
				AUG. 26	454	1	1.2
				SEP. 17	495	3	4.0
				SEP. 18	497	4	5.4

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA
 PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN TRATION (MG/L)	LOAD (TONS)	DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
CROW WING RIVER BASIN--Continued							
05244000 CROW WING RIVER AT NIMROD--Continued							
JUNE 5, 1968	810	15	25	SEP. 19, 1968	498	4	5.4
JUNE 6	830	13	22	SEP. 20	489	5	6.8
JUNE 7	792	17	36	SEP. 21	482	6	7.8
JUNE 8	1040	31	87	SEP. 22	520	5	7.0
JUNE 9	2650	24	172	SEP. 23	567	4	6.1
JUNE 10	2620	18	127	SEP. 24	566	3	4.6
JUNE 11	2880	17	109	SEP. 25	561	3	4.5
JUNE 12	2020	15	82	SEP. 26	554	4	6.0
JUNE 13	1880	17	86	SEP. 27	543	4	5.9
JUNE 14	1850	21	105	SEP. 28	537	4	5.8
JUNE 15	1760	27	128	SEP. 29	525	3	4.3
				SEP. 30	514	2	2.8
MINNESOTA RIVER BASIN							
05315000 REDWOOD RIVER AT MARSHALL							
JAN. 9, 1968	.1	30	0	AUG. 7, 1968	18	100	4.9
FEB. 13	1.2	94	.3	AUG. 8	21	98	5.6
MAR. 12	8.2	42	.9	AUG. 15	8.5	58	1.3
APR. 10	11	31	.9	SEP. 17	4.6	47	.6
MAY 8	9.1	24	.6	SEP. 21	90	61	17
JUNE 12	4.1	29	.3	SEP. 22	73	93	20
JULY 18	2.2	112	.7	SEP. 23	48	70	9.1
JULY 29	16	91	4.0	SEP. 24	45	80	7.3
				SEP. 25	39	55	5.8
				SEP. 26	35	50	4.7
				SEP. 27	38	45	4.6
				SEP. 28	43	41	4.8
				SEP. 29	56	38	5.7
				SEP. 30	68	46	6.4
CANNON RIVER BASIN							
05353800 STRAIGHT RIVER NEAR FARIBAULT							
DEC. 19, 1967	28	39	2.9	JULY 14, 1968	1410	1140	2550
JAN. 22, 1968	16	1	0	JULY 15	1160	409	1280
FEB. 22	11	10	0.3	JULY 16	864	290	676
MAR. 25	41	5	0.6	JULY 17	634	635	1090
APR. 23	223	452	288	JULY 18	545	490	721
APR. 24	440	328	390	JULY 19	408	335	389
APR. 25	386	143	149	JULY 20	314	243	206
APR. 26	260	102	72	JULY 21	252	209	142
APR. 27	185	59	29	AUG. 2	206	516	287
MAY 1	104	22	6.2	AUG. 3	274	432	320
MAY 16	340	1210	1110	AUG. 4	236	340	217
MAY 17	287	295	228	AUG. 5	210	289	170
MAY 18	228	124	76	AUG. 8	404	282	286
MAY 19	185	89	44	AUG. 9	436	310	365
MAY 20	167	100	45	AUG. 10	377	232	236
MAY 21	152	85	35	AUG. 11	282	157	120
MAY 27	202	189	103	AUG. 12	216	142	83
MAY 28	232	158	99	SEP. 9	585	310	490
MAY 29	206	198	110	SEP. 10	510	145	200
MAY '90	179	190	92	SEP. 11	388	102	106
MAY 31	161	211	92	SEP. 12	292	109	86
JUNE 1	220	214	127	SEP. 13	232	138	86
JUNE 2	232	188	118	SEP. 17	182	299	147
JUNE 3	196	154	81	SEP. 18	228	176	108
JUNE 24	143	376	145	SEP. 19	274	127	94
JULY 3	213	217	125	SEP. 22	314	259	220
JULY 12	294	864	857	SEP. 23	687	601	1130
JULY 13	1120	694	4620	SEP. 24	754	327	666
				SEP. 25	624	196	330
				SEP. 26	500	157	212
				SEP. 27	408	184	203
				SEP. 28	350	260	246
CHIPPEWA RIVER BASIN							
05371000 COTTONWOOD RIVER NEAR NEW ULM							
DEC. 13, 1967	12	86	2.8	JULY 28, 1968	3540	244	2330
DEC. 16	12	156	5.1	JULY 29	2970	273	2190
DEC. 23	9.5	202	5.2	JULY 30	2000	143	772
DEC. 30	5.1	218	3.0	JULY 31	2130	295	1700
JAN. 6, 1968	4.8	248	2.2	AUG. 1	2510	316	2140
JAN. 13	4.6	137	1.7	AUG. 2	2400	311	2020
JAN. 16	4.6	63	.8	AUG. 3	1970	268	1430
JAN. 20	4.6	341	4.2	AUG. 4	1090	297	874
JAN. 27	5.3	192	2.7	AUG. 5	980	144	381
FEB. 3	6.6	156	2.8	AUG. 6	668	130	248
FEB. 10	7.0	105	2.0	AUG. 7	743	81	163
FEB. 17	7.4	136	2.7	AUG. 8	1040	119	334
FEB. 20	7.7	127	2.6	AUG. 9	488	171	225
FEB. 24	7.7	200	4.2	AUG. 10	864	349	814
MAR. 2	7.8	190	4.0	AUG. 11	622	147	247
MAR. 9	14	88	3.3	AUG. 12	584	189	268
MAR. 16	9.0	16	3.9	AUG. 13	490	150	236
MAR. 19	127	76	26	AUG. 14	415	125	140
MAR. 30	78	163	34	AUG. 15	368	114	113
				AUG. 16	342	121	112
				AUG. 17	302	87	55

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS)	DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS)
CHIPPEWA RIVER BASIN--Continued							
05371000 COTTONWOOD RIVER NEAR NEW ULM--Continued							
APR. 20, 1968	73	85	17	AUG. 18, 1968	170	45	21
APR. 27	102	224	62	AUG. 19	225	60	38
MAY 18	3.2	97	.8	AUG. 20	219	47	28
MAY 25	24	78	5.0	AUG. 21	199	37	20
JUNE 1	32	115	3.9	AUG. 22	181	35	17
JUNE 8	29	115	9.0	AUG. 23	166	43	19
JUNE 15	146	66	26	AUG. 24	148	54	22
JUNE 21	53	32	4.6	AUG. 31	102	69	19
JUNE 28	60	18	2.9	SEP. 4	90	20	4.9
JUNE 29	66	40	7.1	SEP. 7	79	96	20
JULY 6	47	41	5.2	SEP. 18	253	57	39
JULY 25	472	46	59	SEP. 25	3240	820	7170
JULY 26	1040	148	437	SEP. 26	2310	384	2400
JULY 27	3530	272	2590	SEP. 27	1740	133	625
				SEP. 28	1470	98	389
				SEP. 29	1300	126	442
				SEP. 30	1220	127	418
ROOT RIVER BASIN							
05384000 ROOT RIVER NEAR LANESBORO							
DEC. 19, 1967	81	15	3.3	JUNE 11, 1968	170	1290	592
JAN. 22, 1968	89	29	7.0	JUNE 18	312	1030	888
FEB. 26	75	10	2.0	JUNE 26	266	685	576
MAR. 19	148	13	5.2	JUNE 27	1030	1270	3530
APR. 23	288	263	204	JUNE 28	1220	578	1850
APR. 24	409	382	422	JUNE 29	759	400	820
APR. 25	356	182	175	JUNE 30	530	360	515
MAY 16	742	5020	10100	AUG. 13	130	102	36
MAY 17	508	2290	3390	SEP. 4	330	491	437
MAY 18	376	700	711	SEP. 10	147	98	39
MAY 21	240	170	110				
05385000 ROOT RIVER NEAR HOUSTON							
DEC. 16, 1967	313	53	45	MAY 16, 1968	1960	16500	94940
JAN. 23, 1968	256	40	28	MAY 17	1660	6460	31000
FEB. 27	234	21	13	MAY 18	1200	1850	5990
MAR. 20	330	68	61	JUNE 18	620	6080	10300
MAR. 21	317	123	105	JUNE 19	935	3960	10200
MAR. 22	301	142	115	JUNE 25	460	780	969
MAR. 23	285	118	91	JUNE 26	650	5450	9560
MAR. 24	278	80	60	JUNE 27	995	1120	3080
MAR. 25	274	57	42	JUNE 28	1450	1320	5170
MAR. 26	274	86	64	JUNE 29	1300	900	3200
MAR. 27	301	142	115	JUNE 30	1060	450	1890
MAR. 28	289	197	154	JULY 1	920	420	1040
APR. 23	860	840	1140	AUG. 12	343	172	159
APR. 24	840	592	1020	SEP. 5	700	802	1520
				SEP. 13	352	136	1290
				SEP. 22	510	3240	4460
DES MOINES RIVER BASIN							
05476000 WEST FORK DES MOINES RIVER AT JACKSON							
JAN. 9, 1968	.4	40	.04	AUG. 1, 1968	474	140	179
FEB. 12	2.2	21	.12	AUG. 2	378	121	123
MAR. 11	20	22	1.2	AUG. 3	307	134	152
APR. 8	14	58	2.2	AUG. 4	284	150	115
MAY 10	18	26	1.3	AUG. 5	246	102	68
JUNE 6	1.8	17	.08	AUG. 6	221	74	44
JULY 11	18	132	6.4	AUG. 7	207	64	36
JULY 29	505	114	155	AUG. 8	212	61	35
JULY 30	390	104	110	AUG. 9	233	60	38
JULY 31	381	97	100	AUG. 20	79	77	16
				SEP. 19	189	49	25
				SEP. 23	284	42	32
				SEP. 24	261	48	34
				SEP. 30	345	52	48

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MINNESOTA

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR
OCTOBER 1967 TO SEPTEMBER 1968(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER;
F, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEM- PER- ATURE		DISCHARGE (CFS)	CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	SUSPENDED-SEDIMENT PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										METHOD OF ANALY- SIS
		(C)	(F)				.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00		2.00
MINNESOTA RIVER BASIN																	
05316500 REDWOOD RIVER NEAR REDWOOD FALLS																	
FEB. 12	1625	0	1.8		54	.26											
MAR. 13	0900	0	14		8	.30											
MAR. 27	1330	1	34		26	2.4											
APR. 10	1020	6	52		59	8.3											
MAY 8	1240	9	26		46	3.2											
JUNE 18	0950	19	23		162	10											
JULY 19	1530	25	11		122	3.6											
JULY 31	1045	20	268		245	177											
AUG. 1	1020	19	209		299	169											
AUG. 2	1040	20	150		240	97											
AUG. 13	1945	21	56		75	11											
SEP. 16	1050	18	18		135	6.6	77	78	84	87	90					BWC	
SEP. 27	1020	20	101		107	29											
05326200 JUDICIAL DITCH NO. 1-A NEAR NEW SWEDEN																	
MAR. 18	1425	7	2.5		25	.17											
APR. 22	1105	15	1.9		4	.02											
MAY 21	1035	15	1.1		24	.07											
JUNE 10	1600	23	117		457	144											
JUNE 11	1800	19	58		103	16											
JUNE 12	0830	18	53		80	10											
JUNE 24	1435	21	3.0		68	.55											
JULY 11	1145	27	.7		52	.10											
JULY 13	0900	22	62		110	18	18	41	72	80	82	95				PWC	
JULY 28	1500	20	122		120	40											
JULY 27	1000	19	408		210	230											
JULY 28	1100	21	337		280	255											
AUG. 6	1130	23	34		160	15											
AUG. 9	1300	21	765		80	124											
AUG. 10	1030	20	650		61	107											
AUG. 11	1700	22	606		27	44											
AUG. 13	0700	20	406		20	22											
AUG. 14	1130	18	280		29	22											

ROOT RIVER BASIN

05365000 ROOT RIVER NEAR HOUSTON

MAY 16	1715	0	2610	17000	122000	34	50	65	81	93	99	99	99	100		BWV
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ANALYSES OF BED MATERIAL, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

BED MATERIAL

DATE	TIME	NO. OF SAMPLING POINTS	DISCHARGE (CFS)	PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										METHOD OF ANALYSIS	
				0.016	0.031	0.062	0.125	0.25	0.354	0.50	1.00	2.00	4.00		
MINNESOTA RIVER BASIN															
05326200 JUDICIAL DITCH NO. 1-A NEAR NEW SWEDEN															
JULY 11, 1968	1145	2	0.7		11	19	30	36		50	63				S
CHIPPEWA RIVER BASIN															
05371000 COTTONWOOD RIVER NEAR NEW ULM															
JULY 12, 1968	0835	4	39				1	5	18		86	96	100		S
AUG. 8	1630	4	1420				--	1	6		63	95	100		S

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN NORTH DAKOTA

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CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SiO2)	IRON (FE)	MAN-GANESE (MN)	CAL CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)
RED RIVER OF THE NORTH BASIN												
05051700 WILD RICE RIVER NEAR CAYUGA (LAT 46 07 30 LONG 097 21 40)												
MAR. 27	.32	7.7	--	.17	115	56	282	16	182	740	132	1.5
MAY 14	6.2	11	--	--	195	90	125	17	316	810	47	.4
MAY 19	6.8	19	--	.14	198	83	79	13	308	895	24	.4
JULY 11	.01	21	--	--	158	85	235	17	365	780	89	1.2
05055200 BIG COULLEE NEAR FORT TOTTEN (LAT 47 52 57 LONG 098 58 02)												
OCT. 25	.51	28	--	--	79	24	28	5.2	338	67	9.6	.2
NOV. 21	.51	--	--	--	--	--	--	--	--	--	--	--
05056220 SWEETWATER LAKE AT SWEETWATER (LAT 48 12 37 LONG 098 52 15)												
OCT. 25	A11.02	24	.06	.00	33	33	69	26	236	147	26	.4
MAY 17	A11.26	14	.03	.00	36	34	67	31	254	174	24	.1
05056250 LAC AUX MORTES NEAR CHURCHS FERRY (LAT 48 21 07 LONG 099 05 42)												
OCT. 25	A14.86	19	.08	.28	108	77	105	27	334	485	36	.3
MAY 16	A14.91	5.4	.07	.08	98	54	70	25	309	305	38	.3
05056260 LAKE IRVINE NEAR CHURCHS FERRY (LAT 48 16 57 LONG 099 10 25)												
MAY 16	A13.64	16	.05	.01	60	43	61	26	280	206	29	.3
05056405 BIG COULLEE AT GRAHAM'S ISLAND INLET NEAR FT. TOTTEN (LAT 48 02 25 LONG 099 02 50)												
MAY 16	19	8.8	--	.08	63	57	161	47	365	345	89	.2
05056500 DEVILS LAKE NEAR DEVILS LAKE (LAT 46 04 00 LONG 098 56 07)												
OCT. 25	B11.15	13	.07	.00	66	53	3030	340	991	6180	1340	.2
MAY 17	B11.59	13	.07	.00	40	520	2810	330	936	6020	1280	.3
05056505 NARROWS OF DEVILS LAKE NEAR DEVILS LAKE (LAT 48 01 36 LONG 098 53 44)												
MAY 17	B11.59	14	.12	.05	81	540	2840	330	953	6170	1310	.3
05056506 MISSION BAY OF DEVILS LAKE NEAR DEVILS LAKE (LAT 48 01 36 LONG 098 53 43)												
MAY 17	B10.58	3.6	.05	.00	33	1800	10400	825	1020	22700	3900	.1
05056570 EAST DEVILS LAKE NEAR HAMAR (LAT 47 57 02 LONG 098 36 34)												
OCT. 26	C99.78	7.0	.09	.03	15	2490	14500	2000	1390	33000	5030	.1
MAY 17	B.36	7.2	.07	.02	17	2140	12050	500	1070	28600	4300	.1
05056630 EASTERN STUMP LAKE NEAR LAKOTA (LAT 47 52 04 LONG 098 21 33)												
OCT. 26	C84.51	15	.05	.02	140	4800	21500	1700	888	51800	9250	.1
MAY 17	C85.11	11	.06	.00	130	4100	20000	1180	877	47400	7560	.2
05056670 WESTERN STUMP LAKE NEAR LAKOTA (LAT 47 54 48 LONG 098 23 26)												
OCT. 26	C98.13	3.0	.06	.00	115	323	1500	164	317	3550	852	.1
MAY 17	C98.80	16	.07	.02	128	280	1280	115	350	2940	688	.2
05099380 PEBMUNA RIVER NEAR VANG (LAT 48 55 00 LONG 098 03 23)												
OCT. 26	41	18	--	.08	88	40	76	11	330	229	25	.5
MAR. 21	52	14	--	.05	32	11	23	7.0	127	73	5.4	.2
MAR. 22	77	14	--	.03	35	12	23	7.4	143	71	5.6	.2
MAR. 23	98	--	--	.09	--	--	--	--	--	--	--	--
MAR. 24	99	12	--	.07	32	9.6	20	6.6	120	64	5.2	.3
MAR. 25	327	--	--	.04	--	--	--	--	--	--	--	--
MAY 18	124	18	--	.00	78	29	61	9.1	252	219	13	.3
05099400 LITTLE PEBMUNA RIVER NEAR WALHALLA (LAT 48 52 00 LONG 098 01 00)												
OCT. 26	.50	18	--	.04	80	24	46	6.5	283	149	13	.4
MAR. 21	7.7	17	--	.03	53	14	35	6.8	152	134	9.4	.3
MAR. 22	18	--	--	.00	--	--	--	--	133	--	--	--
MAR. 23	9.4	18	--	.04	47	12	34	6.2	147	116	7.8	.3
MAR. 24	101	--	--	.04	--	--	--	--	128	--	--	--
MAR. 25	165	16	--	.00	94	6.4	19	4.0	114	60	2.2	.3
MAY 18	23	21	--	.00	73	21	66	8.9	192	221	17	.3

A STAGE (FT ABOVE DATUM): FEET ABOVE ARBITRARY DATUM, WHICH IS 20.00 FT BELOW REFERENCE MARK NO. 1.
 B STAGE (FT ABOVE DATUM): TO CONVERT TO SEA-LEVEL ELEVATION, ADD 1400 FT.
 C STAGE (FT ABOVE DATUM): TO CONVERT TO SEA-LEVEL ELEVATION, ADD 1300 FT.

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN NORTH DAKOTA

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	NITRATE (NO3)	ORTHO PHOS- PHATE (PO4)	BORON (B)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C)	DIS- SOLVED SOLIDS (TONS PER AC FT)	DIS- SOLVED SOLIDS (TONS PER DAY)	HARD- NESS (CA, MG)	NON CAR- BONATE HARD- NESS	SODIUM SORP- TION RATIO	SPECI- FIC COND- UCTANCE (MICRO- MHOS)	PH	COLOR
RED RIVER OF THE NORTH BASIN												
05051700 WILD RICE RIVER NEAR CAYUGA (LAT 46 07 30 LONG 097 21 40)												
MAR. 27	6.0	.47	.65	1530	2.08	1.32	517	368	5.4	2040	7.6	11
MAY 14	.4	--	.28	1500	2.04	25.1	855	596	1.9	1840	8.0	20
MAY 19	.3	.34	.21	1340	1.82	24.6	832	579	1.2	1630	7.8	--
JULY 11	3.1	--	.66	1660	2.26	.04	743	444	3.8	2140	7.6	--
05055520 BIG COULEE NEAR FORT TOTTEN (LAT 47 52 57 LONG 098 58 02)												
OCT. 25	.1	--	.08	411	.56	.57	294	17	.7	643	7.9	27
NOV. 21	--	--	--	412	.56	.57	--	--	--	645	--	--
05056220 SWEETWATER LAKE AT SWEETWATER (LAT 48 12 37 LONG 098 52 15)												
OCT. 25	8.4	.77	.09	558	.76	--	218	24	2.0	756	8.1	20
MAY 17	3.3	.43	.13	507	.69	--	227	19	1.9	1090	8.1	20
05056250 LAC AUX MORTES NEAR CHURCHS FERRY (LAT 48 21 07 LONG 099 05 42)												
OCT. 25	9.9	.18	.07	1091	1.48	--	585	311	1.9	1430	8.0	2
MAY 16	1.5	.28	.11	803	1.09	--	465	212	1.4	1140	7.8	45
05056260 LAKE IRVINE NEAR CHURCHS FERRY (LAT 48 16 57 LONG 099 10 25)												
MAY 16	4.1	.75	.11	591	.80	--	325	95	1.5	917	7.7	15
05056405 BIG COULEE AT GRAHAMS ISLAND INLET NEAR FT. TOTTEN (LAT 48 02 25 LONG 099 02 50)												
MAY 16	.9	.32	.14	1000	1.36	51.3	390	91	3.5	1660	8.0	90
05056500 DEVILS LAKE NEAR DEVILS LAKE (LAT 48 04 00 LONG 098 56 07)												
OCT. 25	6.0	1.0	2.0	12800	17.4	--	2440	1630	27	14500	8.0	25
MAY 17	.2	1.4	2.2	12000	16.3	--	2240	1470	26	13800	7.9	20
05056505 NARROWS OF DEVILS LAKE NEAR DEVILS LAKE (LAT 48 01 36 LONG 098 53 44)												
MAY 17	.3	1.4	2.3	12400	16.9	--	2370	1590	25	14400	7.6	18
05056506 MISSION BAY OF DEVILS LAKE NEAR DEVILS LAKE (LAT 48 01 36 LONG 098 53 43)												
MAY 17	.9	.91	5.1	42600	57.9	--	6660	5530	55	36800	8.5	43
05056570 EAST DEVILS LAKE NEAR HAMAR (LAT 47 57 02 LONG 098 36 34)												
OCT. 26	.6	1.7	1.6	61600	83.8	--	10300	8780	62	49100	8.7	40
MAY 17	3.3	1.4	5.4	51300	69.8	--	8840	7560	56	41500	8.4	40
05056630 EASTERN STUMP LAKE NEAR LAKOTA (LAT 47 52 04 LONG 098 21 33)												
OCT. 26	3.6	1.2	8.8	95600	130	--	20100	19290	66	65800	8.4	10
MAY 17	.3	2.4	7.4	88700	121	--	17200	16500	66	66200	7.7	40
05056670 WESTERN STUMP LAKE NEAR LAKOTA (LAT 47 54 48 LONG 098 23 26)												
OCT. 26	1.2	.11	1.6	7090	9.64	--	1610	1350	16	8630	7.6	15
MAY 17	2.7	.81	1.2	5920	8.05	--	1470	1180	15	7380	7.7	20
05099380 PEMBINA RIVER NEAR VANG (LAT 48 55 00 LONG 098 03 23)												
OCT. 26	.3	.27	.15	694	.94	76.8	383	112	1.7	1000	7.7	15
MAR. 21	4.6	1.2	.09	256	.35	35.9	126	22	.9	376	7.5	48
MAR. 22	4.7	1.2	.09	254	.35	52.8	136	19	.9	381	7.6	43
MAR. 23	--	1.2	--	268	.36	70.9	--	--	--	404	7.5	40
MAR. 24	4.9	1.3	.13	228	.31	60.9	119	21	.8	336	7.6	42
MAR. 25	--	1.3	--	218	.30	192	--	--	--	306	--	55
MAY 18	.0	.49	.14	580	.79	194	314	107	1.5	829	8.0	10
05099400 LITTLE PEMBINA RIVER NEAR WALHALLA (LAT 48 52 00 LONG 098 01 00)												
OCT. 26	.4	.10	.11	488	.66	.66	297	65	1.2	745	8.1	5
MAR. 21	3.9	.63	.07	364	.50	7.87	187	62	1.1	539	8.0	24
MAR. 22	--	.72	--	319	.43	15.5	--	--	--	461	8.1	27
MAR. 23	3.0	.66	.58	335	.46	8.50	167	46	1.1	498	7.7	18
MAR. 24	--	.98	--	252	.34	68.7	--	--	--	358	7.7	31
MAR. 25	2.7	.90	.04	217	.30	96.7	111	17	.8	319	7.8	23
MAY 18	.0	.63	.14	563	.77	35.0	265	108	1.8	793	7.6	10

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	DIS-CHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS-CHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
RED RIVER OF THE NORTH BASIN									
05099400 LITTLE PEMBINA RIVER NEAR WALHALLA (LAT 48 52 00 LONG 098 01 00)									
OCT. 10	1220	.40	2	0	MAR. 23	1115	9.4	72	1.8
OCT. 26	1240	.50	12	.02	APR. 9	1450	21	97	5.5
NOV. 9	1230	.64	3	.01	MAY 7	0840	6.0	52	.84
DEC. 7	1420	.53	4	.01	JUNE 6	1210	7.2	32	.62
JAN. 4	0905	.20	10	.01	JULY 31	0830	13	268	9.4
MAR. 6	1410	.58	55	.09	AUG. 27	1720	12	247	8.0
MAR. 13	1510	10	81	2.2					

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE AND PARTICLE SIZE, WATER YEAR

OCTOBER 1967 TO SEPTEMBER 1968
 (METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										METHOD OF ANALYSIS
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	
05099380 PEMBINA RIVER NEAR VANG (LAT 48 55 00 LONG 098 03 23)																
OCT. 26	1315		24	8	9.52	--	--	--	--	--	--	--	--	--	--	
MAR. 21	1430	0	52	67	9.4	--	--	--	--	--	--	--	--	--	--	S
MAR. 22	1230	0	77	48	10	--	--	--	--	--	94	--	--	--	--	S
MAR. 23	1200	0	98	40	11	--	--	--	--	--	93	--	--	--	--	S
MAR. 24	1300	0	99	126	34	--	--	--	--	--	94	--	--	--	--	S
MAR. 25	1115	1	327	524	463	--	--	--	--	--	97	99	100	--	--	V
MAY 17	1030	4	110	273	81	58	72	--	90	--	98	--	--	--	--	SPWC
05099400 LITTLE PEMBINA RIVER NEAR WALHALLA (LAT 48 52 00 LONG 098 01 00)																
MAR. 18	0930		23	470	29	54	71	--	95	--	100	--	--	--	--	SPWC
MAR. 21	1300	0	7.7	89	1.9	--	--	--	--	--	96	--	--	--	--	S
MAR. 22	1130	0	18	57	2.8	--	--	--	--	--	93	--	--	--	--	S
MAR. 24	1210	1	101	1100	300	38	54	--	86	--	94	96	99	100	--	VPWC
MAR. 25	1015	1	165	1360	608	39	56	--	78	--	94	97	100	--	--	VPWC
MAR. 27	1750	2	131	1210	426	48	54	--	90	--	97	99	100	--	--	VPWC
MAY 18	0930	4	23	223	14	50	61	--	87	--	100	--	--	--	--	SPWC

PARTICLE-SIZE ANALYSES OF BED MATERIAL, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
 (METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

DATE	TIME	WATER TEMPERATURE (C)	NUMBER OF SAMPLING POINTS	DISCHARGE (CFS)	BED MATERIAL PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										METHOD OF ANALYSIS	
					.062	.125	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0		64.0
05099400 LITTLE PEMBINA RIVER NEAR WALHALLA (LAT 48 52 00 LONG 098 01 00)																
MAY 18	0930		18	23	3	7	18	63	65	78	87	93	100	--	--	SV

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS- CHARGE (CFS)	SILICA (SIO2)	IRON (FE)	MAN- GANESE (MN)	CAL- CIUM (CA)	MAG- NE- SIUM (MG)	SODIUM (NA)	PO- TAS- SIUM (K)	BICAR- BONATE (HCO3)	CAR- BONATE (CO3)	SULFATE (SO4)	CHLO- RIDE (CL)	FLUO- RIDE (F)	NITRATE (NO3)
ST. CROIX RIVER BASIN														
JUNE 06	717	--	.35	.07	18	4.9	--	--	72	0	6.8	1.0	--	.8
05332500 NAMEKAGON RIVER NEAR TREGO (LAT 45 56 50 LONG 091 53 15)														
JUNE 05	1720	--	.27	.04	17	4.0	--	--	64	0	6.8	1.0	--	.8
05333500 ST. CROIX RIVER NEAR DANBURY (LAT 46 04 30 LONG 092 14 50)														
JUNE 06	289	12	.35	.04	20	6.4	2.9	.6	86	4	4.4	.1	.1	1.0
05340500 ST. CROIX RIVER AT ST. CROIX FALLS (LAT 45 24 30 LONG 092 38 45)														
JUNE 03	8430	--	.50	.13	17	4.7	--	--	66	0	10	2.0	--	1.2
05341500 APPLE RIVER NEAR SOMERSET (LAT 45 09 30 LONG 092 43 00)														
JUNE 03	--	--	.09	.05	31	11	--	--	144	0	7.2	3.0	--	2.2
05341710 WILLOW RIVER NEAR BOARDMAN (LAT 45 03 55 LONG 092 36 52)														
JUNE 07	32	12	.36	.18	34	16	5.7	1.2	183	0	6.0	2.0	.2	5.8
05342000 KINNICKINNIC RIVER NEAR RIVER FALLS (LAT 44 49 50 LONG 092 44 00)														
JUNE 07	90	13	.06	.00	51	25	3.4	.9	242	2	14	6.0	.1	10
05355330 RUSH RIVER NEAR MAIDEN ROCK (LAT 44 34 15 LONG 092 19 44)														
JUNE 07	61	10	.11	.12	54	28	2.4	1.1	280	0	12	2.9	.2	3.3
CHIPPEWA RIVER BASIN														
MAY 29	2080	--	.44	.04	8.6	1.6	--	--	22	0	8.4	1.0	--	1.4
05356500 CHIPPEWA RIVER NEAR BRUCE (LAT 45 27 05 LONG 091 15 40)														
MAY 28	4940	--	.49	.08	6.7	1.8	--	--	21	0	3.6	.5	--	1.3
05358500 FLAMBEAU RIVER AT BABBS ISLAND NEAR WINTER (LAT 45 46 10 LONG 090 45 45)														
MAY 29	--	--	.50	.06	8.9	1.9	--	--	22	0	9.2	1.0	--	1.2
05359500 SOUTH FORK FLAMBEAU RIVER NEAR PHILLIPS (LAT 45 42 15 LONG 092 36 55)														
MAY 29	3160	--	.51	.06	7.3	1.8	--	--	20	0	8.8	2.0	--	1.4
05360500 FLAMBEAU RIVER NEAR BRUCE (LAT 45 22 20 LONG 091 12 35)														
MAY 28	6610	--	.52	.06	8.2	1.9	--	--	24	0	9.6	.5	--	1.3
05362000 JUMP RIVER AT SHELDON (LAT 45 18 30 LONG 090 57 20)														
MAY 28	4770	--	.54	.05	8.2	1.8	--	--	20	0	8.4	1.0	--	1.4
05364000 YELLOW RIVER AT CADOTT (LAT 44 57 10 LONG 091 09 00)														
MAY 28	170	--	.56	.07	9.1	3.6	--	--	36	0	7.2	1.0	--	1.4
05366500 EAU CLAIRE RIVER NEAR FALL CREEK (LAT 44 48 35 LONG 091 16 50)														
MAY 28	2520	--	.83	.01	6.4	2.0	--	--	22	0	8.8	1.0	--	1.3
05367425 RED CEDAR RIVER NEAR CAMERON (LAT 45 24 05 LONG 091 46 39)														
MAY 28	650	8.1	.21	.10	18	4.7	2.8	1.0	76	0	4.4	.4	.1	1.4
05368000 HAY RIVER AT WHEELER (LAT 45 02 50 LONG 091 54 50)														
MAY 28	341	--	.50	.08	35	17	--	--	176	0	12	3.0	--	3.0
05369000 RED CEDAR RIVER AT MENOMONIE (LAT 44 53 00 LONG 091 55 55)														
MAY 28	2250	--	.29	.10	16	6.6	--	--	74	0	7.6	2.0	--	1.8
BLACK RIVER BASIN														
MAY 08	189	--	--	--	12	5.0	--	--	50	0	12	4.0	--	.8
05381360 BLACK RIVER AT BLACK RIVER FALLS (LAT 44 17 18 LONG 090 50 56)														
DEC. 11	--	34	1.4	.02	13	2.1	9.8	2.2	20	20	7.8	4.4	.5	.1
WISCONSIN RIVER BASIN														
MAY 07	146	--	--	--	11	3.9	--	--	38	0	13	2.0	--	.8
05399500 BIG EAU PLEINE RIVER NEAR STRATFORD (LAT 44 49 15 LONG 090 04 35)														
MAY 07	28.6	--	--	--	15	4.3	--	--	54	0	13	10	--	.9
05400100 LITTLE EAU PLEINE RIVER NEAR MARSHFIELD (LAT 44 43 18 LONG 090 05 77)														
MAY 07	9.4	--	--	--	16	4.7	--	--	60	0	19	4.0	--	.9

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TOTAL PHOS PHORUS (PO4)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARD-NESS (CA, MG)	NON-CAR-BONATE HARD-NESS	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-PH Mhos)	TEMP-ERATURE (DEG C)	COLOR	PER-CENT SODIUM	ALKA-LINITY AS CaCO3
ST. CROIX RIVER BASIN													
		05332500	NAMEKAGON RIVER NEAR TREGO (LAT 45 56 50 LONG 091 53 15)										
JUNE 06	--	96	--	.13	186	85	6	--	130	7.4	15	--	59
		05333500	ST. CROIX RIVER NEAR DANBURY (LAT 46 04 30 LONG 092 14 50)										
JUNE 05	--	85	--	.12	395	59	6	--	113	7.4	14	--	52
		05335500	CLAM RIVER NEAR WEBSTER (LAT 45 52 50 LONG 092 29 15)										
JUNE 06	--	91	94	.12	71.0	76	0	.1	148	8.8	16	26	8 77
		05340500	ST. CROIX RIVER AT ST. CROIX FALLS (LAT 45 24 30 LONG 092 38 45)										
JUNE 03	--	100	--	--	--	82	8	--	125	7.3	17	--	--
		05341500	APPLE RIVER NEAR SOMERSET (LAT 45 09 30 LONG 092 43 00)										
JUNE 03	--	153	--	.21	--	123	4	--	241	7.7	--	--	118
		05341710	WILLOW RIVER NEAR BOARDMAN (LAT 45 03 55 LONG 092 36 52)										
JUNE 07	--	190	173	.26	16.4	151	1	.2	306	7.6	15	15	8 150
		05342000	KINNICKINNIC RIVER NEAR RIVER FALLS (LAT 44 49 50 LONG 092 44 00)										
JUNE 07	--	266	244	.36	64.7	230	28	.1	401	8.3	15	2	3 202
		05355330	RUSH RIVER NEAR MAIDEN ROCK (LAT 44 34 15 LONG 092 19 44)										
JUNE 07	--	257	252	.35	42.3	250	20	.1	438	8.1	15	0	2 230
CHIPPEWA RIVER BASIN													
		05356000	CHIPPEWA RIVER AT BISHOPS BRIDGE NEAR WINTER (LAT 45 50 55 LONG 091 04 45)										
MAY 29	--	56	--	.08	314	28	10	--	52	6.9	12	120	-- 18
		05356500	CHIPPEWA RIVER NEAR BRUCE (LAT 45 27 05 LONG 091 15 40)										
MAY 28	--	61	--	.08	814	24	7	--	51	6.7	11	80	-- 17
		05358500	FLAMBEAU RIVER AT BABBS ISLAND NEAR WINTER (LAT 45 46 10 LONG 090 45 45)										
MAY 29	--	56	--	.08	--	30	12	--	58	6.9	12	120	-- 18
		05359500	SOUTH FORK FLAMBEAU RIVER NEAR PHILLIPS (LAT 45 42 15 LONG 092 36 55)										
MAY 29	--	60	--	.08	512	26	9	--	47	6.9	11	120	-- 16
		05360500	FLAMBEAU RIVER NEAR BRUCE (LAT 45 22 20 LONG 091 12 35)										
MAY 28	--	74	--	.10	1320	28	9	--	62	6.7	12	80	-- 20
		05362000	JUMP RIVER AT SHELDON (LAT 45 18 30 LONG 090 57 20)										
MAY 28	--	62	--	.08	798	28	12	--	50	6.7	10	120	-- 16
		05364000	YELLOW RIVER AT CADOTT (LAT 44 57 10 LONG 091 09 00)										
MAY 28	--	77	--	.10	35.3	38	8	--	79	6.9	12	80	-- 30
		05366500	EAU CLAIRE RIVER NEAR FALL CREEK (LAT 44 48 35 LONG 091 16 50)										
MAY 28	--	58	--	.08	395	24	6	--	60	6.8	13	70	-- 18
		05367425	RED CEDAR RIVER NEAR CAMERON (LAT 45 24 05 LONG 091 46 39)										
MAY 28	--	84	78	.11	--	24	6	--	60	6.8	12	12	-- 62
		05368000	HAY RIVER AT WHEELER (LAT 45 02 50 LONG 091 54 50)										
MAY 28	--	171	--	.23	157	158	14	--	296	7.8	13	13	-- 144
		05369000	RED CEDAR RIVER AT MENOMONIE (LAT 44 53 00 LONG 091 55 55)										
MAY 28	--	69	--	.12	541	67	6	--	143	7.4	13	20	-- 61
BLACK RIVER BASIN													
		05361000	BLACK RIVER AT NEILLSVILLE (LAT 44 33 35 LONG 090 36 50)										
MAY 08	.38	90	--	.12	45.9	50	10	--	116	7.1	14	75	-- 41
		05381360	BLACK RIVER AT BLACK RIVER FALLS (LAT 44 17 18 LONG 090 50 56)										
DEC. 11	--	109	104	.15	--	41	0	.7	121	9.6	1	7	33 16
WISCONSIN RIVER BASIN													
		05396000	RIB RIVER AT RIB FALLS (LAT 44 58 25 LONG 089 54 15)										
MAY 07	.14	73	--	.10	--	44	12	--	92	7.1	12	50	-- 31
		05399500	BIG EAU PLEINE RIVER NEAR STRATFORD (LAT 44 49 15 LONG 090 04 35)										
MAY 07	.35	94	--	.13	72.6	55	11	--	141	7.2	14	40	-- 44
		05400100	LITTLE EAU PLEINE RIVER NEAR MARSHFIELD (LAT 44 43 18 LONG 090 05 77)										
MAY 07	.60	111	--	.15	--	60	10	--	141	7.3	12	75	-- 49

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SIO2)	IRON (FE)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	PO-TAS-SIUM (NA)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)	NITRATE (NO3)
WISCONSIN RIVER BASIN--Continued													
05400600 LITTLE PLOVER RIVER NEAR ARNOTT (LAT 44 28 05 LONG 089 29 20)													
SEP. 12	--	16	.21	.02	42	20	2.1	.7	190	0	16	6.0	.3 7.7
05400625 LITTLE PLOVER RIVER NEAR PLOVER (LAT 44 28 15 LONG 089 30 30)													
SEP. 12	--	21	.07	.01	43	21	2.6	.6	200	0	15	6.0	.4 9.1
05400710 MILL CREEK NEAR STEVENS POINT (LAT 44 31 06 LONG 089 39 58)													
MAY 07	28.9	--	--	--	18	7.0	--	--	62	0	19	18	-- 2.5
05402000 YELLOW RIVER AT BABCOCK (LAT 44 18 05 LONG 090 07 15)													
MAY 07	58	--	--	--	10	3.9	--	--	30	0	16	6.0	-- 1.4
05409830 NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 47 LONG 090 54 34)													
APR. 29	--	--	.04	--	--	--	--	--	--	--	--	--	-- .2
JULY 10	--	8.6	.03	.04	55	31	1.6	.9	304	2	12	3.0	.1 .0
05409860 NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 36 LONG 090 54 31)													
NOV. 14	--	12	.06	.05	56	33	.9	.8	314	0	10	3.0	.2 .0
JAN. 08	--	--	.07	--	--	--	--	--	322	0	--	--	-- 2.8
APR. 29	--	--	.04	--	--	--	--	--	--	--	--	--	-- .2
JULY 10	--	9.9	.11	.07	52	31	1.5	.7	294	0	12	2.0	.1 .0
05409870 NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 30 LONG 090 53 49)													
NOV. 14	--	12	.07	.05	56	30	.9	.8	306	0	11	2.0	.2 .0
JAN. 08	--	12	.03	.03	60	30	1.7	.8	324	0	12	3.0	.3 2.8
FEB. 13	--	11	.04	.02	62	34	1.5	.8	340	0	11	3.0	.2 3.3
MAR. 25	--	10	.10	.01	50	32	1.9	.9	294	0	13	2.0	.1 .0
APR. 29	--	9.4	.11	.04	54	33	1.8	.8	316	0	14	3.0	.1 .5
JUNE 03	--	12	.03	.04	52	35	1.5	.7	310	0	10	3.0	.1 .5
JUNE 14	--	--	--	--	54	30	--	--	288	0	11	2.0	-- 2.5
JUNE 18	--	--	--	--	20	9.5	--	--	102	0	8.4	1.0	-- 1.8
JULY 10	--	10	.04	.06	54	33	1.6	.8	304	0	12	3.0	.1 .0
SEP. 10	--	--	--	--	--	--	--	--	230	0	12	2.5	.1 1.8
ROCK RIVER BASIN													
05423000 WEST BRANCH ROCK RIVER NEAR WAUPUN (LAT 43 40 05 LONG 088 39 10)													
FEB. 13	2.5	11	.12	.06	102	52	9.2	4.1	400	0	116	29	.7 10
05423500 SOUTH BRANCH ROCK RIVER AT WAUPUN (LAT 43 38 30 LONG 088 43 15)													
FEB. 13	2.8	12	.60	.64	111	52	23	5.9	372	0	173	42	.2 4.5
05423820 LIMESTONE CREEK NEAR ALLENTON (LAT 43 23 38 LONG 088 20 25)													
NOV. 14	--	--	--	--	--	--	--	--	374	0	136	16	-- 2.9
05423800 KOHLVILLE RIVER NEAR KOHLVILLE (LAT 43 29 02 LONG 088 22 03)													
NOV. 14	--	--	--	--	--	--	--	--	338	0	98	14	-- 1.9
05423900 LOWIRA CREEK NEAR THERESA (LAT 43 32 03 LONG 088 24 57)													
NOV. 28	--	--	--	--	--	--	--	--	424	0	140	22	-- 1.0
05423950 KUMMEL CREEK AT THERESA STATION (LAT 43 32 06 LONG 088 25 58)													
NOV. 28	7.0	12	.17	.06	101	57	25	4.7	451	0	79	55	.1 3.8
05424095 RUBICON RIVER NEAR SLINGER (LAT 43 19 17 LONG 088 19 48)													
NOV. 14	3.0	--	--	--	--	--	--	--	320	0	112	27	-- 4.5
05424150 RUBICON RIVER NEAR HUSTISFORD (LAT 43 19 25 LONG 088 33 56)													
NOV. 29	--	11	.23	.02	95	47	38	5.0	382	0	100	58	.2 2.7
05424250 ASHIPPIUM RIVER NEAR MONTEREY (LAT 43 10 20 LONG 088 32 48)													
DEC. 01	15	--	--	--	--	--	--	--	372	0	84	10	-- 1.6
05424400 OCONOMOWOC RIVER NEAR RICHFIELD (LAT 43 15 50 LONG 088 14 29)													
NOV. 14	1.5	--	--	--	--	--	--	--	208	4	392	15	-- 9.8
05425300 OCONOMOWOC RIVER NEAR PIPERSVILLE (LAT 43 06 30 LONG 088 37 05)													
DEC. 01	--	5.0	.28	.00	50	33	9.6	2.4	254	0	48	15	.2 2.0
05425400 SILVER CREEK AT WATERTOWN (LAT 43 13 35 LONG 088 43 53)													
NOV. 15	5.5	--	--	--	--	--	--	--	430	0	156	84	-- 1.8
05425560 JOHNSON CREEK AT JOHNSON CREEK (LAT 43 04 34 LONG 088 46 33)													
DEC. 01	10	9.4	.20	.04	129	64	6.4	1.8	411	0	213	13	.2 1.4
05425800 CRAWFISH RIVER NEAR DANVILLE (LAT 43 18 24 LONG 088 55 17)													
NOV. 15	--	--	--	--	--	--	--	--	304	0	94	18	-- 5.4

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DATE	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	DIS-SOLVED SOLIDS (TONS AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA/MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH	TEMPERATURE (DEG C)	COLOR	PERCENT SODIUM	ALKALINITY AS CaCO3
WISCONSIN RIVER BASIN--Continued														
		05400600	LITTLE PLOVER RIVER NEAR ARNOTT (LAT 44 28 05 LONG 089 29 20)											
SEP. 12	.06	216	--	.29	--	187	32	.1	357	7.7	--	10	2	156
		05400625	LITTLE PLOVER RIVER NEAR PLOVER (LAT 44 28 15 LONG 089 30 30)											
SEP. 12	.06	223	--	.30	--	194	30	.1	357	8.1	--	5	3	184
		05400710	MILL CREEK NEAR STEVENS POINT (LAT 44 31 08 LONG 089 39 56)											
MAY 07	1.1	135	--	.18	--	74	23	--	203	7.0	11	50	--	51
		05402000	YELLOW RIVER AT BARCOCK (LAT 44 18 05 LONG 090 07 15)											
MAY 07	.28	86	--	.12	136	41	16	--	105	6.7	12	75	--	25
		05409830	NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 47 LONG 090 54 34)											
APR. 29	.05	253	--	.34	--	254	--	--	438	8.2	17	--	--	--
JULY 10	--	242	263	.33	--	265	12	.0	463	8.3	21	5	1	249
		05409860	NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 36 LONG 090 54 31)											
NOV. 14	.27	280	270	.35	--	275	18	.0	468	8.2	7	2	1	258
JAN. 08	--	282	--	.38	--	282	18	--	473	8.1	0	--	--	264
APR. 29	.04	230	--	.31	--	246	--	--	418	8.1	14	--	--	--
JULY 10	.02	238	253	.32	--	257	18	.0	446	8.2	22	5	1	241
		05409870	NEDERLO CREEK NEAR GAYS MILLS (LAT 43 21 30 LONG 090 53 49)											
NOV. 14	.18	253	283	.34	--	263	12	.0	458	8.1	5	2	1	251
JAN. 08	.97	284	282	.39	--	273	8	.0	474	8.1	0	--	1	266
FEB. 13	--	276	294	.38	--	295	16	.0	501	8.2	1	4	1	279
MAR. 25	.08	253	254	.34	--	257	16	.1	453	8.1	8	2	2	241
APR. 29	.04	266	272	.36	--	270	11	.0	476	8.0	9	5	1	259
JUNE 03	.11	248	267	.34	--	274	20	.0	467	8.2	18	3	1	254
JUNE 14	.18	250	--	.34	--	258	22	--	442	8.2	19	--	--	236
JUNE 18	.72	114	--	.16	--	89	6	--	177	7.4	17	--	--	84
JULY 10	.04	250	264	.34	--	270	21	.0	468	8.1	17	5	1	249
SEP. 10	--	192	--	.28	--	208	20	--	364	8.2	11	--	--	189
ROCK RIVER BASIN														
		05423000	WEST BRANCH ROCK RIVER NEAR WAUPUN (LAT 43 40 05 LONG 088 39 10)											
FEB. 13	--	548	531	.75	3.70	469	141	.2	827	7.5	--	8	4	328
		05423500	SOUTH BRANCH ROCK RIVER AT WAUPUN (LAT 43 38 30 LONG 088 43 15)											
FEB. 13	--	640	607	.87	4.84	491	186	.5	926	7.5	--	23	9	305
		05423820	LIMESTONE CREEK NEAR ALLENTON (LAT 43 23 38 LONG 088 20 25)											
NOV. 14	--	558	--	.78	--	410	103	--	827	8.0	3	--	--	307
		05423850	KOHLVILLE RIVER NEAR KOHLVILLE (LAT 43 29 02 LONG 088 22 03)											
NOV. 14	--	460	--	.83	--	367	90	--	703	8.0	3	--	--	277
		05423900	LOMIRA CREEK NEAR THERESA (LAT 43 32 03 LONG 088 24 57)											
NOV. 28	--	598	--	.81	--	472	124	--	890	8.0	1	--	--	348
		05423950	KUMMEL CREEK AT THERESA STATION (LAT 43 32 06 LONG 088 25 58)											
NOV. 28	.16	591	560	.80	11.2	487	117	.5	965	7.8	0	5	10	370
		05424095	RUBICON RIVER NEAR SLINGER (LAT 43 19 17 LONG 088 19 48)											
NOV. 14	--	512	--	.70	4.15	413	151	--	755	7.9	3	--	--	262
		05424150	RUBICON RIVER NEAR HUSTISFORD (LAT 43 19 25 LONG 088 33 56)											
NOV. 29	.90	581	546	.79	--	431	118	.8	908	8.1	0	20	16	313
		05424250	ASHIPPUM RIVER NEAR MONTEREY (LAT 43 10 20 LONG 088 32 48)											
DEC. 01	--	447	--	.61	18.1	395	90	--	703	8.2	0	--	--	305
		05424400	OCONOMOC RIVER NEAR RICHFIELD (LAT 43 15 50 LONG 088 14 29)											
NOV. 14	--	846	--	1.15	3.43	480	303	--	1050	8.3	2	--	--	170
		05425300	OCONOMOC RIVER NEAR PIPERSVILLE (LAT 43 06 30 LONG 088 37 05)											
DEC. 01	.92	302	291	.41	--	261	52	.3	518	7.9	1	5	7	206
		05425400	SILVER CREEK AT WATERTOWN (LAT 43 13 35 LONG 088 43 53)											
NOV. 15	--	898	--	.95	10.4	487	134	--	1060	7.7	2	--	--	353
		05425560	JOHNSON CREEK AT JOHNSON CREEK (LAT 43 04 34 LONG 088 48 33)											
DEC. 01	.03	702	640	.95	19.0	586	248	.1	983	8.0	0	25	2	337
		05425800	CRAWFISH RIVER NEAR DANVILLE (LAT 43 18 24 LONG 088 55 17)											
NOV. 15	--	450	--	.61	--	380	131	--	682	8.2	1	--	--	249

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SIO ₂)	IRON (FE)	MAN-GANESE (MN)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO ₃)	CAR-BONATE (CO ₃)	SULFATE (SO ₄)	CHLO-RIDE (CL)	FLUO-RIDE (F)	NITRATE (NO ₃)
ROCK RIVER BASIN--Continued														
		05425850 WATERLOO CREEK AT PORTLAND (LAT 43 11 47 LONG 088 58 31)												
NOV. 30	--	--	--	--	--	--	--	--	358	0	158	29	--	7.7
		05426300 DUCK CREEK NEAR SULLIVAN (LAT 43 57 41 LONG 088 40 38)												
NOV. 27	8.0	13	.53	.12	135	58	5.4	2.6	374	0	233	13	.2	1.8
		05427510 KOSHKONONG CREEK NEAR BUSSEYVILLE (LAT 42 54 44 LONG 089 00 15)												
DEC. 01	--	14	.22	.04	99	52	10	2.2	388	0	114	18	.3	5.5
		05427530 ROCK RIVER AT NEWVILLE (LAT 42 49 48 LONG 089 01 17)												
NOV. 13	--	8.3	1.7	.08	67	34	12	3.5	267	0	70	22	.2	5.4
		05427550 SAUNDERS CREEK AT ALBION (LAT 42 52 43 LONG 089 03 57)												
NOV. 13	8.5	--	--	--	--	--	--	--	375	0	90	11	--	3.6
		05428600 EAST BRANCH STARKWEATHER CREEK AT MADISON (LAT 43 05 57 LONG 089 19 54)												
NOV. 13	--	--	--	--	--	--	--	--	336	0	79	74	--	29
		05428650 WEST BRANCH STARKWEATHER CREEK AT MADISON (LAT 43 05 58 LONG 089 20 18)												
NOV. 13	--	--	--	--	--	--	--	--	406	0	170	17	--	8.2
		05430050 BADFISH CREEK NEAR OREGON (LAT 42 55 41 LONG 089 19 44)												
DEC. 04	--	19	.41	.00	69	40	130	15	328	0	52	173	.8	48
		05430150 BADFISH CREEK NEAR COOKSVILLE (LAT 42 50 00 LONG 089 11 48)												
NOV. 15	--	--	--	--	--	--	--	--	390	0	57	115	--	27
		05430200 YAHARA RIVER NEAR FULTON (LAT 42 48 40 LONG 089 09 01)												
NOV. 15	--	14	.17	.02	56	29	24	3.8	264	0	36	34	.4	8.6
		05430300 MARSH CREEK NEAR JANESVILLE (LAT 42 43 15 LONG 089 03 30)												
NOV. 13	--	15	.20	.00	99	39	3.0	.9	301	0	128	7.0	.2	4.9
ILLINOIS RIVER BASIN														
		05543830 FOX RIVER AT WAUKESHA (LAT 43 00 17 LONG 088 14 37)												
JAN. 22	--	12	.06	.20	100	42	71	4.8	360	0	112	108	.4	1.2
		05546500 FOX RIVER AT WILMOT (LAT 42 30 40 LONG 088 10 45)												
JAN. 24	--	11	.17	.04	87	42	25	3.1	362	0	78	40	.5	10

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TOTAL PHOSPHORUS (PO4)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	TEMPERATURE (DEG C)	COLOR	PERCENT SODIUM	ALKALINITY AS CaCO3
ROCK RIVER BASIN--Continued														
05425850 WATERLOO CREEK AT PORTLAND (LAT 43 11 47 LONG 088 40 38)														
NOV. 30	--	603	--	.82	--	500	206	--	888	8.2	1	--	--	294
05426300 DUCK CREEK NEAR SULLIVAN (LAT 43 57 41 LONG 088 40 38)														
NOV. 27	.12	687	646	.93	14.8	576	269	.1	955	8.0	1	25	2	307
05427510 KOSHKONONG CREEK NEAR BUSSEYVILLE (LAT 42 54 44 LONG 089 00 15)														
DEC. 01	.75	531	507	.72	--	461	143	.2	814	8.0	1	10	4	318
05427530 ROCK RIVER AT NEWVILLE (LAT 42 49 48 LONG 089 01 17)														
NOV. 13	.53	374	354	.51	--	307	88	.3	611	7.6	4	15	8	219
05427550 SAUNDERS CREEK AT ALBION (LAT 42 52 43 LONG 089 03 57)														
NOV. 13	--	467	--	.64	10.7	415	107	--	730	7.9	4	--	--	308
05428600 EAST BRANCH STARKWEATHER CREEK AT MADISON (LAT 43 05 57 LONG 089 19 54)														
NOV. 13	--	441	--	.60	--	398	122	--	734	7.4	6	--	--	276
05428650 WEST BRANCH STARKWEATHER CREEK AT MADISON (LAT 43 05 58 LONG 089 20 18)														
NOV. 13	--	733	--	1.00	--	542	209	--	1140	7.4	5	--	--	333
05430050 BADFISH CREEK NEAR OREGON (LAT 42 55 41 LONG 089 19 44)														
DEC. 04	21	724	729	.98	--	337	68	3.1	1320	7.5	12	10	44	269
05430150 BADFISH CREEK NEAR COOKSVILLE (LAT 42 50 00 LONG 089 11 48)														
NOV. 15	--	614	--	.84	--	365	45	--	1070	7.5	4	--	--	320
05430200 YAHARA RIVER NEAR FULTON (LAT 42 48 40 LONG 089 09 01)														
NOV. 15	3.5	348	339	.47	--	259	42	.6	589	7.8	2	5	17	217
05430300 MARSH CREEK NEAR JAMESVILLE (LAT 42 13 15 LONG 089 03 30)														
NOV. 13	.02	461	447	.63	--	408	157	.1	705	8.2	6	5	2	247
ILLINOIS RIVER BASIN														
05543830 FOX RIVER AT WAUKESHA (LAT 43 00 17 LONG 088 14 37)														
JAN. 22	--	672	640	.91	--	422	127	1.5	1060	7.5	6	6	26	295
05546500 FOX RIVER AT WILMOT (LAT 42 30 40 LONG 088 10 45)														
JAN. 24	--	476	475	.65	--	390	93	.6	779	7.6	0	10	12	297

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
ST. CROIX RIVER BASIN							
05332500 NAMEKAGON RIVER NEAR TREGO (LAT 45 56 50 LONG 091 53 15)							
APR. 26, 1967	7	--	115	JUNE 5, 1967	19	--	150
05333500 ST. CROIX RIVER NEAR DANBURY (LAT 46 04 30 LONG 092 14 50)							
DEC. 9, 1966	0	1100	140	SEP. 28, 1967	9	972	130
JAN. 9, 1967	0	955	145	NOV. 3,	3	1092	140
FEB. 13	0	976	140	JAN. 12, 1968	0	756	160
MAR. 21	0	1170	145	FEB. 5	6	569	100
APR. 28	10	1800	190	MAR. 14	0	1020	140
JUNE 7	16	1140	115	APR. 12	12	1410	160
JULY 27	23	1150	130	JULY 19	23	3480	100
AUG. 22	18	921	150				
05336000 ST. CROIX RIVER NEAR GRANTSBURG (LAT 45 55 25 LONG 092 38 20)							
DEC. 10, 1966	0	1560	70	NOV. 6, 1967	1	1514	155
JAN. 10, 1967	0	1450	90	DEC. 6,	1	1600	160
FEB. 14	0	1570	170	JAN. 12, 1968	0	1260	200
MAR. 21	0	1660	180	FEB. 8	0	908	140
APR. 28	11	2980	115	MAR. 14	0	166	170
JUNE 6	19	1680	140	APR. 12	13	2350	220
JULY 21	27	1500	130	MAY 13	15	4500	105
SEP. 28	12	1375	140	JULY 19	23.5	7250	120
05340500 ST. CROIX RIVER AT ST. CROIX FALLS (LAT 45 24 30 LONG 092 38 45)							
JAN. 11, 1967	2	--	200	JAN. 5, 1968	0	--	240
MAY 7	8	--	145	APR. 18	12	--	170
JUNE 10	17	--	240	JULY 18	23	--	125
NOV. 7	6	--	260	AUG. 29	19	--	180
NOV. 29	3	--	230				
CHIPPEWA RIVER BASIN							
05356000 CHIPPEWA RIVER AT BISHOPS BRIDGE NEAR WINTER (LAT 45 50 55 LONG 091 04 45)							
DEC. 6, 1966	1	--	70	AUG. 28, 1967	20	608	60
JAN. 12, 1967	2	--	75	OCT. 2,	16	232	70
FEB. 16	1	--	90	OCT. 13,	6	--	65
MAR. 25	3	--	115	APR. 8, 1968	5	96.2	80
MAY 4	8	1040	80	JULY 26,	22	838	55
05356500 CHIPPEWA RIVER NEAR BRUCE (LAT 45 27 05 LONG 091 15 40)							
DEC. 14, 1966	0	1410	140	FEB. 5, 1968	0	1230	100
MAY 4, 1967	7	2270	85	MAR. 5	0	560	140
JULY 12	23	1339	80	APR. 15	6	957	120
AUG. 16	23	872	80	MAY 10	13	876	90
SEP. 22	18	728	85	JULY 30	23	1360	85
OCT. 26	5	942	100	AUG. 26	18	878	90
NOV. 30	0	--	80	SEP. 23	17	4710	60
JAN. 3, 1968	0	1340	78				
05359500 SOUTH FORK FLAMBEAU RIVER NEAR PHILLIPS (LAT 45 42 15 LONG 090 36 55)							
DEC. 5, 1966	1	302	84	DEC. 4, 1967	2	199	110
JAN. 13, 1967	0	231	105	JAN. 9, 1968	0	131	140
FEB. 17	0	175	50	FEB. 5	0	190	95
MAR. 25	1	378	115	MAR. 12	0	230	145
MAY 3	6	1050	50	APR. 9	6	604	100
AUG. 28	19	469	82	MAY 16	12	1940	75
SEP. 12	16	131	90	JULY 11	21	931	70
SEP. 25	17	145	90	JULY 25	22	547	60
OCT. 31	3	367	90				
05360500 FLAMBEAU RIVER NEAR BRUCE (LAT 45 22 20 LONG 091 12 35)							
JAN. 12, 1967	1	1440	100	FEB. 5, 1968	1	863	125
MAY 3	8	3360	60	MAR. 6	--	801	140
JUNE 8	16	3240	130	APR. 15	9	1800	85
AUG. 18	28	768	90	MAY 22	11	4530	55
SEP. 25	17	787	75	JULY 25	23	2160	25
OCT. 26	7	795	75	AUG. 26	19	1010	100
NOV. 30	1	753	110	SEP. 23	17	3960	50
JAN. 3, 1968	--	412	110				
05362000 JUMP RIVER AT SHELDON (LAT 45 18 30 LONG 090 57 20)							
DEC. 14, 1966	0	87.5	230	JAN. 4, 1968	0	32.9	50
JAN. 12, 1967	1	87.0	160	FEB. 6	0	56.8	210
MAY 3	5	364	80	MAR. 18	1	575	115
JUNE 8	16	425	120	APR. 19	12	961	105
AUG. 18	19	45.5	160	MAY 16	11	9880	55
SEP. 22	20	43.6	175	JULY 25	20	242	120
OCT. 27	4	200	175	AUG. 27	19	70.9	160
DEC. 1	1	66.3	195	SEP. 24	15	992	95
05365500 CHIPPEWA RIVER AT CHIPPEWA FALLS (LAT 44 55 35 LONG 091 24 40)							
APR. 2, 1967	2	79600	90	FEB. 6, 1968	1	--	100
JUNE 7	18	8720	155	APR. 5	5	--	160
JULY 17	21	8380	90	JULY 26	23	--	100
AUG. 25	19	230	150	AUG. 28	19	232	160
OCT. 7	11	220	125	SEP. 24	18	--	105
DEC. 8	2	--	120				

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEM- PERATURE (°C)	DIS- CHARGE (CFS)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)		DATE	WATER TEM- PERATURE (°C)	DIS- CHARGE (CFS)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)
CHIPPEWA RIVER BASIN--Continued								
05367425 RED CEDAR RIVER NEAR CAMERON (LAT 45 24 05 LONG 091 46 39)								
MAR. 29, 1967	4	1000	140		JAN. 2, 1968	0	214	140
MAR. 31	3	3700	100		FEB. 9	0	138	50
APR. 1	7	1430	100		MAR. 8	1	210	130
MAY 4	11	336	150		APR. 8	5	228	100
JUNE 5	18	--	155		MAY 10	10	424	145
JUNE 9	16	328	280		JULY 15	23	--	110
JULY 17	23	330	150		JULY 26	20	846	135
AUG. 4	20	266	140		AUG. 23	26	344	155
SEP. 7	19	201	100		SEP. 8	17	324	160
SEP. 21	19	343	155		SEP. 20	15	340	160
NOV. 13	1	224	130					
05368000 HAY RIVER AT WHEELER (LAT 45 02 50 LONG 091 54 40)								
JAN. 9, 1967	1	150	310		NOV. 8, 1967	1	159	315
FEB. 28	0	130	140		DEC. 8	3	163	330
MAR. 29	2	2360	95		JAN. 5, 1968	0	119	180
MAR. 30	3	8780	80		FEB. 12	0	156	330
APR. 1	3	5260	80		APR. 12	14	198	130
MAY 5	8	279	60		APR. 16	12	--	350
JUNE 9	16	353	370		MAY 24	16	265	300
JULY 18	17	188	320		JULY 18	22	491	280
AUG. 14	20	196	320		AUG. 30	16	200	310
OCT. 3	13	154	325					
05369000 RED CEDAR RIVER AT MENOMONIE (LAT 44 53 00 LONG 091 55 55)								
JAN. 10, 1967	1	--	200		DEC. 8, 1967	2	--	160
MAR. 30	2	8660	120		APR. 16, 1968	8	--	220
MAY 5	9	2620	120		MAY 1	10	2020	180
MAY 8	9	1440	120		MAY 23	15	2600	150
JUNE 10	18	2460	330		JUNE 26	18	3060	140
JULY 18	22	2650	170		FEB. 2	22	2520	170
AUG. 15	22	738	170		AUG. 28	21	2260	160
OCT. 3	18	562	170		SEP. 26	14	--	180
NOV. 8	4	1570	180		SEP. 27	16	4520	160
05369500 CHIPPEWA RIVER AT DURAND (LAT 44 37 45 LONG 091 58 10)								
JAN. 23, 1967	0	4300	155		FEB. 12, 1968	0	2170	100
FEB. 23	0	7150	125		MAR. 19	7	5750	160
APR. 3	3	104000	100		APR. 17	10	7150	145
APR. 11	6	34490	60		MAY 20	14	33500	90
MAY 16	12	10400	100		JUNE 27	16	28300	75
AUG. 24	24	5700	115		AUG. 2	22	6960	110
OCT. 4	17	4150	130		AUG. 28	21	4140	130
NOV. 9	5	5000	140		SEP. 26	15	24200	105
DEC. 15	0	--	150					
05370000 EAU GALLE RIVER AT SPRING VALLEY (LAT 44 51 00 LONG 092 14 15)								
JAN. 10, 1967	1	10.1	360		MAR. 7, 1968	1	56.0	260
FEB. 22	1	9.35	350		APR. 15	8	9.04	350
MAR. 30	8	1400	80		MAY 23	16	24.9	200
MAY 6	16	13.7	370		JUNE 27	12	230	180
JUNE 11	14	14.8	550		JULY 31	23	23.6	330
AUG. 15	23	14.0	360		AUG. 15	16	12.7	390
OCT. 3	16	9.58	380		AUG. 29	21	6.11	380
FEB. 7, 1968	0	9.84	420					
TREMPEALEAU RIVER BASIN								
05379400 TREMPEALEAU RIVER AT ARCADIA (LAT 44 15 15 LONG 091 30 25)								
DEC. 20, 1966	1	179	225		OCT. 17, 1967	12	211	260
JAN. 24, 1967	0	212	275		NOV. 29	0	147	260
MAR. 2	0	217	200		JAN. 10, 1968	0	166	205
APR. 12	9	494	220		FEB. 21	0	147	245
MAY 17	13	310	220		MAR. 27	10	230	260
JUNE 13	24	389	400		MAR. 27	10	230	272
JULY 12	23	252	230		JUNE 5	26	276	260
AUG. 7	22	226	275		AUG. 27	16	303	205
SEP. 11	23	208	220		SEP. 26	12	358	226
05379500 TREMPEALEAU RIVER AT DODGE (LAT 44 07 55 LONG 091 33 10)								
DEC. 20, 1966	1	248	240		NOV. 29, 1967	0	140	240
JAN. 24, 1967	0	217	250		JAN. 11, 1968	0	145	150
MAR. 3	0	225	240		FEB. 21	0	150	280
MAR. 28	2	6350	90		APR. 24	6	1300	270
APR. 12	9	555	280		JUNE 5	26	316	280
JUNE 13	24	465	250		JULY 30	21	619	240
AUG. 8	23	253	300		AUG. 27	19	315	345
SEP. 12	23	204	230		SEP. 25	15	454	270
OCT. 18	8	209	260					
BLACK RIVER BASIN								
05381000 BLACK RIVER AT NEILLSVILLE (LAT 44 33 35 LONG 090 36 50)								
DEC. 13, 1966	0	134	205		JAN. 11, 1968	0	10.6	400
JAN. 13, 1967	1	66.4	160		FEB. 19	0	15.5	430
FEB. 27	0	96.0	180		MAR. 29	7	--	135
MAY 1	13	319	110		APR. 3	7	364	120
JUNE 6	22	93.3	140		MAY 8	14	189	120
JULY 28	28	156	115		JUNE 11	23	633	105
AUG. 31	19	245	120		JULY 16	23	3150	90
OCT. 6	13	34.7	175		AUG. 20	23	85.6	180
DEC. 1	0	54.8	220		SEP. 27	14	283	100

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DIST. CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DIST. CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
BLACK RIVER BASIN--Continued							
05382000 BLACK RIVER NEAR GALESVILLE (LAT 44 03 45 LONG 091 17 30)							
DEC. 20, 1966	1	377	130	OCT. 18, 1967	9	469	120
JAN. 24, 1967	0	457	135	NOV. 30	0	460	140
MAR. 2	0	566	130	JAN. 11, 1968	0	264	150
APR. 13	7	730	80	FEB. 22	0	287	140
JUNE 5	19	--	115	MAR. 28	9	969	120
JUNE 20	21	6400	220	APR. 25	9	6370	85
JULY 13	19	1070	100	JUNE 4	20	4000	85
AUG. 8	21	581	150	AUG. 27	22	678	100
SEP. 12	23	395	120	SEP. 25	16	2330	70
LA CROSSE RIVER BASIN							
05383000 LA CROSSE RIVER NEAR WEST SALEM (LAT 43 54 05 LONG 091 07 05)							
DEC. 19, 1966	3	254	360	SEP. 12, 1967	23	302	230
JAN. 25, 1967	1	340	240	OCT. 19	9	196	260
MAR. 1	1	172	285	NOV. 30	2	172	270
MAR. 27	2	1610	135	MAR. 13, 1968	2	171	260
APR. 13	9	9	--	MAR. 28	9	182	240
JUNE 5	20	--	280	APR. 25	7	342	280
JUNE 13	24	376	220	JUNE 5	23	277	270
JUNE 20	22	393	340	JUNE 21	22	203	220
JULY 10	23	215	250	AUG. 28	23	231	225
AUG. 8	22	238	280	SEP. 24	19	328	240
AUG. 11	19	231	270				
WISCONSIN RIVER BASIN							
05390180 WISCONSIN RIVER AT CONOVER (LAT 46 02 52 LONG 089 15 57)							
DEC. 8, 1966	1	234	80	NOV. 6, 1967	0	207	70
JAN. 5, 1967	0	232	95	JAN. 15, 1968	0	150	100
AUG. 3	19	145	80	FEB. 26	0	115	120
AUG. 29	18	166	70	APR. 12	11	128	80
SEP. 28	9	196	80				
05391000 WISCONSIN RIVER AT RAINBOW LAKE NEAR LAKE TOMAHAWK (LAT 45 50 00 LONG 089 32 50)							
DEC. 16, 1966	1	878	72	MAR. 7, 1968	1	749	100
JAN. 18, 1967	1	--	80	APR. 12	6	256	70
APR. 13	3	817	50	MAY 14	12	296	70
AUG. 2	22	642	70	JUNE 18	18	422	60
SEP. 11	17	639	70	JULY 18	24	1870	55
OCT. 17	8	438	75	AUG. 28	19	659	65
JAN. 30, 1968	1	684	80	SEP. 17	17	907	80
05393500 SPIRIT RIVER AT SPIRIT FALLS (LAT 45 26 55 LONG 089 58 50)							
DEC. 17, 1966	0	19.3	180	SEP. 8, 1967	18	8.37	160
JAN. 17, 1967	0	18.0	50	OCT. 17	8	14.9	140
FEB. 28	0	18.4	135	FEB. 17, 1968	0	6.63	160
APR. 13	3	342	70	MAR. 27	1	--	85
MAY 16	9	29.3	60	MAR. 28	1	--	85
JUNE 21	17	259	90	APR. 3	3	99.1	80
AUG. 2	19	18.1	110				
05394500 PRAIRIE RIVER NEAR MERRILL (LAT 45 14 10 LONG 089 38 50)							
DEC. 15, 1966	0	89.2	180	AUG. 23, 1967	18	--	170
JAN. 18, 1967	0	78.9	180	SEP. 8	14	83.8	180
MAR. 1	0	78.9	220	OCT. 18	8	135	150
APR. 12	3	741	60	JAN. 9, 1968	0	85.2	190
MAY 18	13	186	120	FEB. 16	0	73.0	195
JUNE 22	19	232	160	MAR. 27	7	183	150
AUG. 1	19	95.5	155	APR. 4	4	--	115
05395000 WISCONSIN RIVER AT MERRILL (LAT 45 10 40 LONG 089 40 45)							
DEC. 16, 1966	1	2120	92	DEC. 5, 1967	1	1820	120
JAN. 18, 1967	0	1920	90	JAN. 9, 1968	0	1740	110
MAR. 1	0	2100	100	FEB. 16	0	1700	120
APR. 12	3	8060	60	MAR. 27	4	1800	120
MAY 18	12	2515	60	APR. 29	11	2650	80
JUNE 22	20	4480	100	JUNE 13	19	6750	80
JULY 31	25	1900	75	JULY 2	16	11300	50
SEP. 7	18	2170	160	SEP. 6	19	3080	120
05397500 EAU CLAIRE RIVER AT KELLY (LAT 44 55 05 LONG 089 33 00)							
DEC. 15, 1966	0	58.5	310	FEB. 15, 1968	0	44.7	300
JAN. 19, 1967	0	51.3	50	MAR. 26	3	283	145
APR. 11	6	1140	50	APR. 4	5	311	155
MAY 22	14	165	165	MAY 10	10	187	155
JUNE 23	19	261	205	MAY 16	12	1170	115
JULY 25	21	75.5	225	MAY 17	11	--	70
AUG. 31	14	136	185	JUNE 12	18	237	140
OCT. 5	13	80.9	220	JULY 16	26	472	105
NOV. 30	0	92.3	265	AUG. 21	21	214	150
JAN. 10, 1968	0	53.5	285	SEP. 25	13	287	160
05398000 WISCONSIN RIVER AT ROTHSCHILD (LAT 44 53 10 LONG 089 37 50)							
APR. 11, 1967	4	14500	65	JUNE 20, 1967	18	8890	180
MAY 22	13	4420	100	SEP. 25, 1968	16	4950	100

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
WISCONSIN RIVER BASIN--Continued							
05399500 BIG EAU PLEINE RIVER NEAR STRATFORD (LAT 44 49 15 LONG 090 04 35)							
DEC. 20, 1966	0	13.0	180	FEB. 19, 1968	0	0.46	360
JAN. 17, 1967	0	6.68	140	APR. 2	9	84.7	155
FEB. 28	0	9.67	250	MAY 7	14	28.6	140
APR. 11	4	547	110	MAY 16	12	12300	70
MAY 19	14	34.9	120	MAY 16	12	11600	70
JUNE 20	17	1300	150	MAY 17	11	--	70
JULY 25	27	20.5	150	JULY 10	26	72.1	110
AUG. 28	18	181	180	JULY 15	23	829	115
OCT. 12	6	22.9	200	AUG. 19	24	23.4	190
NOV. 30	0	7.32	260	SEP. 27	14	51.0	160
JAN. 12, 1968	0	2.98	310				
05400600 LITTLE PLOVER RIVER NEAR ARNOTT (LAT 44 28 05 LONG 089 29 20)							
JULY 18, 1968	18	4.00	360	AUG. 22, 1968	18	2.74	350
05400650 LITTLE PLOVER RIVER AT PLOVER (LAT 44 28 20 LONG 089 31 40)							
JULY 18, 1968	14	--	310	AUG. 22, 1968	13	8.91	445
JULY 19	15	11.2	320	SEP. 4	13	--	340
JULY 23	13	--	305	SEP. 24	12	10.0	330
05401050 TENMILE CREEK NEAR NEKOOSA (LAT 44 15 44 LONG 089 48 38)							
JULY 18, 1968	17	133	260	AUG. 27, 1968	12	47.0	255
JULY 19	17	--	280	SEP. 30	13	74.5	290
05401100 FOURTEEN MILE CREEK NEAR NEW ROME (LAT 44 12 15 LONG 089 48 29)							
JULY 19, 1968	22	125	320	AUG. 27, 1968	21	22.6	310
05401535 BIG ROCHE A CRI CREEK NEAR ADAMS (LAT 44 05 52 LONG 089 46 30)							
JULY 20, 1968	16	79.1	220	SEP. 5, 1968	15	60.6	225
05402000 YELLOW RIVER AT BABCOCK (LAT 44 18 05 LONG 090 07 15)							
JAN. 12, 1968	0	9.98	130	MAY 17, 1968	12	--	65
FEB. 19	0	6.89	150	AUG. 19	19	17.4	105
APR. 2	8	79.3	140	SEP. 30	13	56.5	95
MAY 7	12	58.5	105				
05403500 LEMONWEIR RIVER AT NEW LISBON (LAT 43 52 50 LONG 090 09 40)							
DEC. 19, 1966	1	110	160	OCT. 25, 1967	10	192	140
JAN. 26, 1967	1	182	155	DEC. 5	1	140	150
MAR. 3	0	147	150	FEB. 20, 1968	0	83.0	110
JULY 12	22	--	120	APR. 4	6	238	160
JULY 14	19	166	140	MAY 3	16	378	110
AUG. 12	19	107	200	JUNE 10	24	226	140
SEP. 15	24	411	140	SEP. 4	21	146	140
OCT. 23	10	140	140				
05404000 WISCONSIN RIVER NEAR WISCONSIN DELLS (LAT 43 36 20 LONG 089 45 25)							
DEC. 20, 1966	0	--	200	SEP. 26, 1967	17	4930	160
JAN. 24, 1967	0	--	200	OCT. 6	2	4580	170
FEB. 28	0	--	210	OCT. 27	7.5	6600	160
APR. 4	3	49300	160	APR. 9, 1968	6	6400	220
APR. 18	8	22890	80	JUNE 11	24	10200	155
JUNE 22	21	19000	200	AUG. 6	25	6300	100
JULY 21	24	4070	240	SEP. 3	21	4280	110
AUG. 29	21	6270	125				
05405000 BARABOO RIVER NEAR BARABOO (LAT 43 28 55 LONG 089 38 00)							
DEC. 20, 1966	1	80.2	320	SEP. 19, 1967	19	299	210
JAN. 24, 1967	1	217	410	OCT. 27	2	272	340
FEB. 28	0	137	360	DEC. 6	2	158	365
MAR. 30	3	2777	290	JAN. 9, 1968	0	141	400
APR. 18	11	392	310	FEB. 19	0	75.9	365
MAY 24	17	--	280	APR. 4	8	541	260
JUNE 22	--	655	240	JUNE 11	24	157	200
JULY 12	22	--	340	AUG. 6	26	84.1	310
JULY 18	23	89.1	340	SEP. 3	19	131	310
AUG. 29	21	123	340				
05406500 BLACK EARTH CREEK AT BLACK EARTH (LAT 43 08 00 LONG 089 44 00)							
DEC. 20, 1966	4	18.0	525	DEC. 27, 1967	0	20.6	494
JAN. 25, 1967	0	14.5	185	JAN. 18, 1968	2	19.1	540
MAR. 1	3	17.6	570	FEB. 27	3	18.9	510
MAY 19	13	--	500	APR. 4	8	26.9	520
MAY 24	15	20.4	560	APR. 26	9	31.4	530
JUNE 30	16	28.0	510	MAY 29	13	19.7	520
JULY 18	18	17.8	520	JUNE 12	19	16.8	520
AUG. 22	16	17.0	510	JULY 10	20	21.0	460
SEP. 12	15	15.9	540	JULY 24	21	31.3	450
SEP. 27	11	17.2	510	AUG. 6	22	20.2	520
OCT. 10	9	20.9	540	AUG. 19	17	19.4	530
OCT. 24	12	19.7	575	SEP. 3	20	18.0	520
NOV. 7	7	40.1	520	SEP. 16	15	27.9	550

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEMPERATURE (°C)	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
WISCONSIN RIVER BASIN--Continued							
05407000 WISCONSIN RIVER AT MUSCODA (LAT 43 12 00 LONG 090 26 25)							
DEC. 13, 1966	1	--	260	FEB. 8, 1968	0	6140	245
JAN. 24, 1967	1	5500	230	MAR. 4	0	4930	280
MAR. 3,	0	6300	260	APR. 19	11	8960	280
MAY 16,	14	10900	120	MAY 27	14	16500	190
SEP. 29,	13	4870	200	JULY 1	22	41600	140
DEC. 11,	2	6510	210	AUG. 15	23	6310	195
JAN. 16, 1968	0	4730	270	SEP. 20	17	13800	185
05408000 KICKAPOO RIVER AT LA FARGE (LAT 43 34 30 LONG 090 38 35)							
DEC. 14, 1966	0	--	410	DEC. 1, 1967	0	33.2	430
MAR. 11, 1967	1	--	250	JAN. 12, 1968	0	164	350
APR. 14	11	187	440	FEB. 23	0	65.7	460
MAY 19	16	197	420	MAR. 30	10	111	430
JUNE 12	22	264	360	APR. 26	10	39.2	440
JULY 11	23	158	430	JUNE 3	18	217	450
JULY 14	18	208	400	JUNE 22	24	1770	185
AUG. 9	19	27.1	470	JULY 29	20	198	420
SEP. 13	23	25.6	380	AUG. 30	17	207	430
OCT. 24	7	52.5	445				
05408500 KNAPP CREEK NEAR BLOOMINGDALE (LAT 43 40 05 LONG 090 46 55)							
DEC. 23, 1966	1	31.46	360	AUG. 10, 1967	16	1.82	400
JAN. 25, 1967	1	39.4	105	SEP. 14	23	3.15	280
MAR. 1	1	1.80	320	OCT. 20	9.5	1.92	330
MAR. 11	1	--	220	DEC. 4	0	2.65	310
MAR. 11	1	13.6	190	JAN. 12, 1968	0	1.10	225
MAR. 25	1	83.8	105	FEB. 29	0	1.35	360
APR. 14	14	4.54	290	MAR. 30	10	2.78	320
MAY 19	17	1.91	260	JUNE 21	20	201	90
JULY 11	22	1.75	320	AUG. 29	19	1.70	320
05410000 KICKAPOO RIVER AT GAYS MILLS (LAT 43 19 10 LONG 090 51 10)							
DEC. 14, 1966	0	--	400	DEC. 4, 1967	1	200	450
JAN. 17, 1967	0	248	460	JAN. 15, 1968	0	187	380
MAR. 27	3	3200	170	MAR. 25	7	253	430
JULY 17	21	251	455	MAY 24	14	325	470
AUG. 29	18	281	700	JUNE 22	21	1250	210
SEP. 19	19	247	440	AUG. 13	19	259	500
OCT. 31	7	277	450	SEP. 26	15	406	500
05410500 KICKAPOO RIVER AT STEUBEN (LAT 43 11 25 LONG 090 52 30)							
DEC. 13, 1966	0	286	420	MAR. 25, 1968	7	305	440
JAN. 16, 1967	0	287	460	MAY 24	14	308	465
MAR. 26	4	3300	180	JULY 1	19	2050	380
MAY 4	11	320	460	AUG. 12	22	314	460
JAN. 15, 1968	0	232	470	SEP. 26	15	489	480
FEB. 9	0	335	350				
GRANT RIVER BASIN							
05413500 GRANT RIVER AT BURTON (LAT 42 43 10 LONG 090 49 10)							
DEC. 15, 1966	0	60.2	565	FEB. 12, 1968	--	49.3	610
JAN. 18, 1967	0	44.0	560	MAR. 20	8	61.3	515
FEB. 23	0	70.9	530	APR. 16	13	77.8	540
MAR. 27	7	299	420	MAY 21	17	66.7	570
JULY 18	23	50.4	520	JUNE 18	22	93.8	560
AUG. 30	21	43.1	525	JUNE 26	20	451	400
SEP. 20	20	59.0	500	JULY 24	23	286	405
OCT. 18	9	53.8	540	AUG. 16	21	100	610
DEC. 19	1	81.0	570	SEP. 25	17	98.6	540
JAN. 18, 1968	0	53.2	570				
PLATTE RIVER BASIN							
05414000 PLATTE RIVER NEAR ROCKVILLE (LAT 42 43 55 LONG 090 38 25)							
DEC. 15, 1966	0	41.0	560	MAR. 20, 1968	7	70.8	500
JAN. 18, 1967	0	35.3	360	APR. 16	13	55.8	530
FEB. 24	--	30.3	540	MAY 21	16	83.5	550
MAR. 27	7	171	415	JUNE 19	19	69.6	540
AUG. 30	21	35.0	500	JULY 25	21	86.5	420
OCT. 18	10	41.7	500	AUG. 21	26	53.5	530
DEC. 19	1	58.5	550	SEP. 25	16	89.9	560
JAN. 16, 1968	0	38.0	555				
GALENA RIVER BASIN							
05415000 GALENA RIVER AT BUNCOMBE (LAT 42 30 50 LONG 090 22 40)							
DEC. 15, 1966	3	38.6	800	JAN. 17, 1968	0	27.9	840
JAN. 19, 1967	0	21.7	670	FEB. 10	0	22.9	850
FEB. 24	--	26.0	600	MAR. 14	2	30.5	800
MAY 8	11	29.5	770	APR. 17	13	46.2	760
JULY 19	25	26.3	775	MAY 22	14	38.0	800
AUG. 31	17	19.5	890	JUNE 25	20	74.7	700
SEP. 14	20	506	365	AUG. 8	23	116	610
SEP. 20	22	35.9	780	AUG. 8	25	179	700
NOV. 1	9	115	710	SEP. 24	20	232	500
DEC. 5	2	44.9	800				

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

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DATE	WATER TEMPERATURE (°C)	DISTANCE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEMPERATURE (°C)	DISTANCE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)
GALENA RIVER BASIN--Continued							
05415500 EAST FORK GALENA RIVER AT COUNCIL HILL (LAT 42 28 05 LONG 090 20 20)							
DEC. 15, 1966	1	3,87	950	DEC. 5, 1967	2	8,06	850
JAN. 19, 1967	0	5,46	910	JAN. 17, 1968	0	7,22	900
APR. 13	9	8,31	800	FEB. 10	0	8,05	930
MAY 5	11	5,09	850	MAR. 14	1	5,90	900
JULY 4	15	8,51	625	APR. 17	12	20,1	720
AUG. 31	25	3,77	1200	MAY 22	18	5,28	760
SEP. 14	19	41,9	300	JUNE 25	19	8,81	770
SEP. 20	21	5,28	860	AUG. 8	23	66,2	530
NOV. 1	9	83,4	540	SEP. 24	20	27,5	850
ROCK RIVER BASIN							
05423000 WEST BRANCH ROCK RIVER NEAR WAUPUN (LAT 43 40 05 LONG 088 39 10)							
JAN. 9, 1967	0	1,80	750	JAN. 10, 1968	0	1,30	720
FEB. 13	1	2,43	800	FEB. 13	0	2,46	810
MAR. 20	1	7,82	700	FEB. 27	0	2,80	740
APR. 27	8	12,8	650	MAR. 19	8	13,1	830
JULY 6	19	2,18	790	APR. 29	13	23,8	730
AUG. 7	22	0,92	850	MAY 20	11	33,6	750
SEP. 11	18	0,29	800	JUNE 4	28	11,5	860
OCT. 10	8	0,95	750	JULY 11	21	10,3	760
NOV. 2	7	50,7	680	AUG. 27	17	4,38	760
NOV. 13	4	9,34	680	SEP. 21	16	8,90	760
DEC. 13	1	10,8	820				
05423500 SOUTH BRANCH ROCK RIVER AT WAUPUN (LAT 43 38 30 LONG 088 43 15)							
DEC. 13, 1966	1	2,73	695	DEC. 13, 1967	1	12,9	950
JAN. 9, 1967	0	15,4	930	JAN. 10, 1968	0	1,89	850
FEB. 13	0	4,08	875	FEB. 13	0	2,85	1000
MAR. 21	1	20,0	800	FEB. 27	0	2,05	850
APR. 28	12	18,0	850	MAR. 19	3	23,1	870
JULY 6	18	1,34	750	APR. 24	8	77,0	760
AUG. 7	22	0,69	880	APR. 29	14	--	910
SEP. 11	12	0,18	890	MAY 20	13	34,9	850
OCT. 10	7	3,38	820	JUNE 5	21	11,5	900
OCT. 20	9	3,22	860	JULY 11	22	11,1	870
NOV. 13	6	14,3	1000	AUG. 20	28	28,2	530
05424000 EAST BRANCH ROCK RIVER NEAR MAYVILLE (LAT 43 31 45 LONG 088 34 00)							
OCT. 26, 1966	9	--	860	DEC. 13, 1967	1	61,3	820
DEC. 13	3	89,0	550	JAN. 10, 1968	0	5,87	1000
JAN. 9, 1967	0	18,9	920	FEB. 14	0	35,8	780
FEB. 13	0	44,5	840	MAR. 19	3	122	540
MAR. 21	0	96,8	850	APR. 29	13	207	690
APR. 28	9	113	700	JUNE 5	24	80,1	710
JULY 6	20	64,1	750	JULY 11	22	58,5	710
AUG. 7	22	11,3	725	AUG. 21	29	40,5	640
OCT. 10	10	8,85	900	SEP. 18	18	14,2	740
NOV. 14	4	97,2	790				
05425500 ROCK RIVER AT WATERTOWN (LAT 43 11 25 LONG 088 43 35)							
DEC. 15, 1966	2	256	670	NOV. 16, 1967	2	487	600
JAN. 11, 1967	0	112	850	JAN. 11, 1968	0	103	690
FEB. 13	0	284	780	FEB. 10	0	78,7	1000
MAR. 10	1	297	850	MAR. 18	2	116	580
MAR. 23	1	542	600	APR. 26	9	851	640
APR. 28	7	809	710	JUNE 13	21	389	690
JUNE 5	22	97,0	875	JULY 17	28	454	645
AUG. 9	23	39,2	840	AUG. 28	22	134	860
SEP. 14	20	26,2	670	SEP. 24	21	243	600
OCT. 12	9	24,1	580				
05428000 CRAWFISH RIVER AT MILFORD (LAT 43 08 00 LONG 088 51 00)							
DEC. 5, 1966	1	55,9	740	OCT. 12, 1967	8	29,2	800
JAN. 5, 1967	1	255	440	NOV. 20	1	264	780
FEB. 16	0	189	775	JAN. 11, 1968	0	55,9	960
MAR. 13	0	--	415	FEB. 19	0	76,7	850
MAR. 23	1	638	520	MAR. 18	2	168,7	430
APR. 28	8	461	630	JUNE 17	22	327	485
JUNE 5	22	119	650	JULY 17	27	263	620
AUG. 9	22	96,3	590	AUG. 28	24	185	550
SEP. 14	19	37,4	650	SEP. 25	20	183	660
05429500 YAHARA RIVER NEAR MC FARLAND (LAT 43 00 30 LONG 089 18 15)							
DEC. 23, 1966	2	113	435	NOV. 21, 1967	3	157	480
JAN. 25, 1967	1	210	460	DEC. 5	1	124	440
MAR. 1	2	208	440	DEC. 29	0	117	378
APR. 12	7	189	400	FEB. 27, 1968	2	108	460
APR. 26	12	174	420	APR. 26	12	112	440
MAY 24	14	128	440	MAY 26	14	66,6	450
JULY 16	24	91,0	415	JUNE 12	22	72,8	430
JULY 27	24	115	420	JUNE 25	21	131	430
AUG. 7	23	86,3	400	JULY 2	20	301	500
AUG. 21	24	17,0	380	JULY 10	24	188	430
SEP. 5	26	8,03	360	JULY 15	25	191	410
SEP. 12	18	9,86	380	JULY 24	28	187	440
SEP. 19	23	21,5	325	AUG. 1	25	118	430
SEP. 27	16	39,2	390	AUG. 6	28	112	420
OCT. 3	18	29,8	380	AUG. 13	24	93,2	420
OCT. 9	9	50,0	405	AUG. 19	26	80,8	420
OCT. 17	14	46,5	400	SEP. 3	24	55,4	410
OCT. 24	11	69,5	420	SEP. 16	21	51,7	440
NOV. 7	4	238	410	SEP. 24	20	123	410

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), DECEMBER 1966 TO SEPTEMBER 1968

DATE	WATER TEM- PERATURE (°C)	DIS- CHARGE (CFS)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)	DATE	WATER TEM- PERATURE (°C)	DIS- CHARGE (CFS)	SPECIFIC CON- DUCTANCE (MICROMHOS AT 25°C)
ROCK RIVER BASIN--Continued							
05430500 ROCK RIVER AT AFTON (LAT 42 36 40 LONG 089 04 10)							
DEC. 22, 1966	1	1139	645	JAN. 19, 1968	1	739	675
JAN. 23, 1967	1	934	650	MAR. 4	4	822	700
MAY 19	17	1670	680	APR. 16	14	918	590
SEP. 4	18	162	600	MAY 6	14	2140	570
OCT. 4	17	494	630	JUNE 28	17	3720	565
NOV. 10	2	2094	640	JULY 15	25	2900	560
DEC. 28	1	--	564	AUG. 16	24	603	590
05431500 TURTLE CREEK NEAR CLINTON (LAT 42 35 55 LONG 088 51 50)							
MOV. 29, 1966	1	48.0	625	DEC. 15, 1967	0	67.4	640
FEB. 14, 1967	1	56.5	650	JAN. 25, 1968	0	57.1	660
MAR. 22	4	75.3	585	MAR. 5	1	58.8	580
APR. 12	9	116	560	APR. 17	10	76.8	590
MAY 19	18	92.6	610	MAY 20	14	98.8	600
AUG. 2	26	51.7	600	JUNE 26	15	244	425
SEP. 1	16	38.1	650	JULY 25	26	132	460
OCT. 9	9	55.1	560	SEP. 27	17	104	600
NOV. 11	1	97.2	650				
05432500 PECATONICA RIVER AT DARLINGTON (LAT 42 40 30 LONG 090 06 55)							
DEC. 16, 1966	1	85.4	580	DEC. 5, 1967	3	71.0	570
JAN. 20, 1967	0	49.1	650	JAN. 18, 1968	0	60.0	645
MAR. 1	--	65.3	670	FEB. 13	0	58.2	690
MAR. 29	7	204	520	APR. 17	13	105	600
MAY 17	14	101	600	MAY 23	14	77.9	600
JULY 20	24	62.0	600	JUNE 26	17	269	370
AUG. 31	19	45.1	600	JULY 25	23	159	425
05433000 E. BRANCH PECATONICA RIVER NEAR BLANCHARDVILLE (LAT 42 47 10 LONG 089 51 40)							
DEC. 16, 1966	2	84.3	500	JAN. 18, 1968	0	80.3	500
JAN. 20, 1967	0	62.0	530	FEB. 10	0	70.9	540
MAY 16	16	100	565	MAR. 15	1	68.3	500
JULY 20	25	71.0	580	APR. 17	13	93.0	500
SEP. 1	16	55.7	550	MAY 23	14	82.9	510
SEP. 21	20	66.6	520	JUNE 27	14	320	365
OCT. 19	7	64.7	500	AUG. 6	27	90.5	510
DEC. 20	1	80.9	500	SEP. 23	18	149	460
05434500 PECATONICA RIVER AT MARTINTOWN (LAT 42 30 35 LONG 089 46 00)							
JAN. 19, 1967	0	232	600	FEB. 10, 1968	0	354	540
MAR. 1	0	285	550	MAR. 15	1	295	560
MAY 17	18	443	440	APR. 18	13	492	545
SEP. 1	18	254	560	MAY 23	15	373	570
SEP. 21	20	299	520	JUNE 27	17	1350	265
DEC. 12	2	397	550	AUG. 7	27	513	440
JAN. 17, 1968	0	305	570	SEP. 23	18	628	580
05436500 SUGAR RIVER NEAR BRODHEAD (LAT 42 36 40 LONG 089 23 50)							
DEC. 22, 1966	1	180	505	JAN. 19, 1968	0	226	520
JAN. 23, 1967	0	194	500	MAR. 4	2	196	490
MAY 10	12	226	475	APR. 12	16	242	445
JULY 24	27	445	480	MAY 13	16	232	460
SEP. 4	21	191	510	JUNE 28	16	1030	340
OCT. 5	20	198	480	JULY 25	23	473	440
NOV. 14	1	350	480	AUG. 23	28	237	440
DEC. 28	0	611	241	SEP. 27	14	621	410
ILLINOIS RIVER BASIN							
05543830 FOX RIVER AT WAUKESHA (LAT 43 00 17 LONG 068 14 37)							
DEC. 5, 1966	4	11.1	1100	DEC. 18, 1967	1	23.2	1175
JAN. 5, 1967	5	12.6	1300	JAN. 22, 1968	6	112.5	1125
FEB. 7	3	29.3	1100	MAR. 7	8	12.2	1175
MAR. 13	2	96.3	690	APR. 10	11	41.7	945
APR. 17	13	65.6	650	MAY 9	17	54.4	860
MAY 25	19	27.0	770	JUNE 20	21	85.3	700
JUNE 8	21	21.8	600	JULY 16	26	51.5	600
JUNE 26	21	45.4	800	AUG. 20	23	163	440
OCT. 4	22	12.5	1075	SEP. 30	17	6.92	790
NOV. 6	3	22.3	1000				
05546500 FOX RIVER AT WILMOT (LAT 42 30 40 LONG 088 10 45)							
MAR. 23, 1967	1	366	650	JAN. 24, 1968	0	--	600
MAR. 25	1	660	650	FEB. 6	1	--	640
APR. 13	9	--	650	MAR. 8	0	--	650
MAY 17	16	--	650	MAY 10	17	--	690
SEP. 7	22	--	650	JUNE 21	21	--	600
OCT. 3	20	--	640	JULY 19	28	1020	550
NOV. 9	1	250	640	SEP. 26	16	--	650
DEC. 16	0	--	725				

PERIODIC DETERMINATION OF SUSPENDED-SEDIMENT DISCHARGE, JULY 1967 TO OCTOBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
ST. CROIX RIVER BASIN									
05335380 BASHAW BROOK NEAR SHELL LAKE (LAT 45 47 02 LONG 092 07 51)									
APR. 19, 1968	1430	6.3	2	T	JULY 19, 1968	1600	8.0	6	T
MAY 27	1245	11	13	T	AUG. 30	1045	5.2	6	T
JUNE 28	1100	7.6	6	T					
CHIPPEWA RIVER BASIN									
05359500 SOUTH FORK FLAMBEAU RIVER NEAR PHILLIPS (LAT 45 42 15 LONG 090 36 55)									
APR. 9, 1968	0900	604	2	3	AUG. 18, 1968	1410	353	3	3
APR. 16	0745	651	6	11	AUG. 26	1645	243	2	1
MAY 16	1015	2060	14	78	SEP. 5	1515	890	4	10
MAY 19	1715	3540	12	115	SEP. 10	1230	1140	3	9
JUNE 25	0945	2510	7	47					
05368000 HAY RIVER AT WHEELER (LAT 45 02 50 LONG 091 54 40)									
APR. 16, 1968	1445	198	7	4	MAY 3, 1968	0845	261	20	14
APR. 17	0850	191	4	2	MAY 23	1745	256	4	3
APR. 23	1230	560	68	103	JUNE 20	1240	325	28	25
MAY 1	1450	289	10	8	JULY 18	1420	505	34	46
TREMPEALEAU RIVER BASIN									
05379400 TREMPEALEAU RIVER AT ARCADIA (LAT 44 15 15 LONG 091 30 25)									
APR. 23, 1968	1700	1090	1190	3500	AUG. 3, 1968	1305	421	99	113
APR. 24	0930	984	523	1390	AUG. 3	1335	421	104	118
APR. 24	1005	980	511	1350	AUG. 27	0920	300	121	96
JUNE 27	1000	1530	516	2130	AUG. 27	0925	300	99	80
JUNE 27	1110	1500	444	1800	SEP. 26	1015	417	49	55
05379500 TREMPEALEAU RIVER AT DODGE (LAT 44 07 55 LONG 091 33 10)									
AUG. 2, 1968	1100	526	69	98	SEP. 14, 1968	1015	426	61	70
AUG. 6	1500	400	47	51					
BAD AXE RIVER BASIN									
05387100 NORTH FORK BAD AXE RIVER NEAR GENOA (LAT 43 33 10 LONG 091 08 58)									
OCT. 4, 1967	0900	40	27	3	JULY 19, 1968	0945	40	152	16
APR. 26, 1968	1015	40	46	5	AUG. 29	0915	26	112	8
JUNE 4	0950	28	46	3	AUG. 29	1015	26	66	5
JULY 19	0915	40	143	15	SEP. 24	1220	37	46	5
WISCONSIN RIVER BASIN									
05393500 SPIRIT RIVER AT SPIRIT FALLS (LAT 45 26 55 LONG 089 58 50)									
NOV. 7, 1967	1430	17	3	T	JUNE 14, 1968	1330	207	8	4
MAR. 27, 1968	1745	100	6	2	JUNE 21	1030	619	48	80
MAR. 28	1210	130	32	11	JUNE 21	1425	869	36	84
MAR. 28	1600	130	28	10	JUNE 21	1535	980	32	85
APR. 3	1445	107	5	1	JULY 5	1100	160	6	3
APR. 23	1500	365	5	5	JULY 15	1000	884	8	19
APR. 24	1600	345	10	9	AUG. 1	0900	83	3	1
MAY 8	1000	60	3	T	AUG. 6	1130	30	2	T
MAY 16	0930	995	5	13	AUG. 16	1600	14	9	T
MAY 16	1110	1180	60	191	AUG. 20	1000	36	6	1
MAY 16	1305	1330	68	244	SEP. 3	1500	29	5	T
MAY 16	1310	1330	74	266	SEP. 5	1215	335	14	13
MAY 22	0930	295	6	5	SEP. 10	1000	302	12	10
MAY 27	1000	869	28	66					
05394500 PRAIRIE RIVER NEAR MERRILL (LAT 45 14 10 LONG 089 38 50)									
JULY 31, 1967	1530	86	8	2	NOV. 10, 1967	1000	130	2	1
AUG. 28	0945	235	8	5	DEC. 5	0915	95	1	T
SEP. 21	1400	90	2	T	MAY 16, 1968	0940	748	46	93
OCT. 27	1000	200	4	2	JUNE 21	1735	612	14	23
05399500 BIG EAU PLEINE RIVER NEAR STRATFORD (LAT 44 49 15 LONG 090 04 35)									
MAR. 28, 1968	0930	1520	59	242	JUNE 21, 1968	0800	1310	127	449
MAR. 28	1340	1480	68	272	JUNE 21	1215	1680	63	286
APR. 2	1520	83	14	3	JUNE 25	0850	2580	46	320
APR. 4	1430	27	6	T	JUNE 26	2000	7690	58	1200
APR. 13	0900	1040	89	250	JUNE 27	0800	6260	23	387
APR. 14	1145	1150	58	180	JUNE 28	1620	1410	9	34
APR. 17	1000	234	34	21	JULY 12	1100	128	32	11
APR. 20	1315	1300	79	277	JULY 15	1605	873	17	40
APR. 20	1930	2070	74	414	JULY 14	1645	2080	69	388
MAY 7	1710	28	20	2	JULY 27	0850	378	70	21
MAY 14	1645	84	26	6	AUG. 6	1050	747	22	44
MAY 16	1425	12800	245	8470	AUG. 8	1240	247	8	5
MAY 17	0730	3810	60	617	AUG. 8	1710	1930	74	346
MAY 19	0800	706	24	46	AUG. 8	2000	2100	78	442
MAY 24	0830	314	13	11	AUG. 19	1600	23	12	1
MAY 24	1220	543	14	21	AUG. 20	0800	1640	47	208
MAY 24	1710	782	12	25	SEP. 5	1610	154	12	5
MAY 28	2005	5480	133	1970	SEP. 9	1000	1300	22	77
MAY 27	0745	5400	42	612	SEP. 18	1020	239	20	13
JUNE 1	0755	571	8	12	SEP. 18	1620	1620	44	192
JUNE 10	1345	79	30	6	SEP. 27	1245	53	1	T

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ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 PERIODIC DETERMINATION OF SUSPENDED-SEDIMENT DISCHARGE, JULY 1967 TO OCTOBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
WISCONSIN RIVER BASIN--Continued									
05400650 LITTLE PLOVER RIVER AT PLOVER (LAT 44 28 20 LONG 089 31 40)									
APR. 4, 1968	1330	9.2	18	T	JULY 18, 1968	1125	12	4	T
APR. 4	1335	9.2	14	T	JULY 19	1800	11	4	T
MAY 10	1525	9.7	16	T	AUG. 22	1100	8.9	10	T
MAY 14	0910	9.2	13	T	SEP. 25	1130	10	1	T
JUNE 14	0815	12	6	T					
05401050 TENMILE CREEK NEAR NEKOOSA (LAT 44 15 44 LONG 089 48 38)									
APR. 5, 1968	1555	60	172	28	JUNE 13, 1968	1725	63	42	7
APR. 6	0815	58	81	13	JULY 19	0845	128	93	32
MAY 14	1030	56	94	14	AUG. 27	1045	47	13	2
MAY 16	1310	90	259	63	SEP. 30	1530	72	24	5
05402000 YELLOW RIVER AT BABCOCK (LAT 44 18 05 LONG 090 07 15)									
SEP. 1, 1967	0922	20	9	T	NOV. 27, 1967	0825	25	6	T
OCT. 11	1407	46	6	1					
05404200 NARROWS CREEK AT LOGANVILLE (LAT 43 26 32 LONG 090 02 06)									
APR. 29, 1968	1300	16	20	1	SEP. 5, 1968	1450	8.3	16	T
JUNE 10	1530	7.3	30	1	SEP. 30	1155	8.6	26	1
05405000 BARABOO RIVER NEAR BARABOO (LAT 43 28 55 LONG 089 38 00)									
OCT. 10, 1967	1600	240	32	21					
05406640 OTTER CREEK NEAR HIGHLAND (LAT 43 01 40 LONG 090 16 40)									
JULY 24, 1968	1130	8.2	192	4	SEP. 27, 1968	1050	5.0	8	T
JULY 24	1255	3.9	20	T	SEP. 27	1150	5.0	20	T
AUG. 20	1340	3.9	64	1					
05409830 NEDERLO CREEK NEAR GAYS MILLS, NO. 7 (LAT 43 21 47 LONG 090 54 34)									
MAR. 14, 1968	1030	.62	8	T	JUNE 14, 1968	1230	.75	42	T
APR. 15	1230	.75	1	T	JULY 11	1045	.77	14	T
05409860 NEDERLO CREEK NEAR GAYS MILLS, NO. 4 (LAT 43 21 36 LONG 090 54 31)									
MAR. 14, 1968	1120	.81	10	T	JULY 11, 1968	1115	1.02	12	T
MAR. 25	1800	.79	12	T					
05409870 NEDERLO CREEK NEAR GAYS MILLS, NO. 3 (LAT 43 21 30 LONG 090 53 49)									
NOV. 14, 1967	1400	2.41	30	T	JUNE 14, 1968	1200	2.25	142	1
MAR. 14, 1968	1300	2.09	18	T	JUNE 18	1145	3.20	1910	16
MAR. 25	1245	2.20	13	T	JULY 11	1130	2.32	5	T
APR. 16	1630	2.36	24	T	AUG. 8	0815	2.31	10	T
APR. 23	1600	2.30	35	T	SEP. 4	1100	2.15	38	T
GRANT RIVER BASIN									
05413500 GRANT RIVER AT BURTON (LAT 42 43 10 LONG 090 49 10)									
JUNE 18, 1968	1630	90	310	75	JUNE 27, 1968	0810	377	572	582
JUNE 26	1425	400	874	944	JULY 24	1445	306	743	614
JUNE 26	1650	503	998	1360	AUG. 16	1000	98	208	55
JUNE 26	2050	554	1020	1530					
ROCK RIVER BASIN									
05423000 WEST BRANCH ROCK RIVER NEAR WAUPUN (LAT 43 40 05 LONG 088 39 10)									
MAR. 28, 1968	1530	7.9	76	2	JUNE 4, 1968	1600	13	56	2
APR. 24	1445	74	42	8	JULY 11	1300	11	82	2
MAY 20	1145	34	150	14	AUG. 21	1045	4.9	58	1
05424000 EAST BRANCH ROCK RIVER NEAR MAYVILLE (LAT 43 31 45 LONG 088 34 00)									
OCT. 5, 1967	1325	4.4	80	1	OCT. 27, 1967	1030	26	18	1
05426000 CRAWFISH RIVER AT MILFORD (LAT 43 06 00 LONG 088 51 00)									
OCT. 1, 1968	1650	19	86	4	OCT. 27, 1968	1000	54	60	9
05427800 TOKEN CREEK NEAR MADISON (LAT 43 10 52 LONG 089 19 28)									
APR. 4, 1968	1330	18	116	6	JULY 24, 1968	0920	21	204	12
MAY 8	1405	14	108	4	AUG. 19	1655	16	47	2
JUNE 26	1005	122	658	216	SEP. 25	1715	22	69	4
05430500 ROCK RIVER NEAR APTON (LAT 42 36 40 LONG 089 04 10)									
MAR. 26, 1966	1430	5120	104	1440	SEP. 28, 1966	1430	464	58	73
APR. 9	1545	3900	116	1220	MAR. 22, 1967	1615	2460	108	717
MAY 27	1630	1860	158	793	JUNE 11	1735	2790	166	1250
JULY 15	1500	1440	100	389	OCT. 27	1345	878	81	192

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PERIODIC DETERMINATIONS OF SUSPENDED SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	SEDIMENT CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
TURKEY RIVER BASIN											
05411600 TURKEY RIVER AT SPILLVILLE											
NOV. 13	1505	3	15	7	.3	MAY 21	1400	18	55	95	14
DEC. 13	1600	0	15	28	1.1	JUNE 3	1435	25	35	26	2.5
JAN. 16	1130	0	6.9	370	6.9	JULY 8	1415	23	57	26	4.0
FEB. 13	1530	0	16	8	.3	AUG. 12	1850	23	70	24	4.5
MAR. 11	1615	0	28	15	1.1	SEP. 9	1510	17	45	11	1.3
MAY 13	1520	18	23	20	1.2						
IOWA RIVER BASIN											
05449500 IOWA RIVER NEAR ROWAN											
OCT. 4	1050	17	22	22	1.3	APR. 3	1430	11	22	9	.5
NOV. 1	1330	7	30	10	.8	APR. 30	0950	14	91	25	6.1
DEC. 4	1340	1	23	63	3.9	JUNE 4	1145	24	34	42	3.9
FEB. 1	1500	1	23	80	5.0	AUG. 9	1110	22	157	51	22
MAR. 18	0900	2	43	14	1.8	SEP. 4	1000	19	133	120	43
05454000 RAPID CREEK NEAR IOWA CITY											
OCT. 31	1300	9	77	145	30	MAY 1	0800	13	14	8	.3
NOV. 29	1255	2	13	46	1.6	MAY 27	1150	12	21	340	19
DEC. 28	1330	0	88.8	30	.7	JUNE 26	1330	16	54	1790	260
FEB. 27	1330	0	4.0	12	.1	JULY 29	1450	24	3.8	78	.8
MAR. 26	1140	10	6.8	14	.3	AUG. 28	1345	19	.17	37	T
05454300 CLEAR CREEK NEAR CORALVILLE											
OCT. 31	1600	9	190	730	370	MAY 27	1020	12	43	360	42
DEC. 27	1530	0	29	18	1.4	JUNE 27	1200	14	88	490	110
FEB. 27	1210	0	14	6	.2	JULY 30	1345	24	5.2	3	T
MAR. 26	0935	9	23	39	2.4	AUG. 28	0915	17	2.0	8	T
APR. 29	1315	11	70	190	36						
05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY											
OCT. 31	1430	11	6.0	52	.8	FEB. 27	1615	0	1.1	66	.2
NOV. 29	1555	1	1.0	100	.3	MAY 1	--	21	.66	9	T
JAN. 3	1345	1	8.33	150	.1	JULY 31	1120	24	.18	140	.1
05455500 ENGLISH RIVER AT KALONA											
OCT. 31	1120	7	899	350	850	APR. 29	0945	10	349	340	320
DEC. 28	1040	0	83	20	4.5	MAY 29	1240	18	107	250	72
JAN. 31	1845	1	218	75	44	JUNE 28	0930	18	188	510	280
FEB. 29	0935	0	37	6	.6	JULY 31	1410	24	17	57	2.8
MAR. 28	1620	10	83	56	13	AUG. 29	1000	20	8.3	66	1.5
SKUNK RIVER BASIN											
05472500 NORTH SKUNK RIVER NEAR SIGOURNEY											
OCT. 16	1050	12	90	350	85	MAY 20	1040	14	75	77	16
NOV. 20	1100	3	34	47	4.3	JUNE 10	1040	26	29	130	10
DEC. 20	1230	--	56	23	3.5	JULY 15	1000	28	18	170	8.3
FEB. 19	1145	1	23	23	1.4	AUG. 19	0930	23	15	145	5.9
MAR. 18	1045	9	74	90	18	SEP. 18	1010	19	61	190	31
APR. 15	1050	11	159	260	110						
DES MOINES RIVER BASIN											
05483000 EAST FORK HARDIN CREEK NEAR CHURDAN											
NOV. 2	1115	4	.10	5	T	MAY 1	1500	22	3.0	14	.1
DEC. 5	--	2	.06	84	T	JUNE 4	0825	29	2.0	32	.2
FEB. 6	1300	0	.32	6	T	JULY 1	1430	21	10	83	2.2
MAR. 6	1425	1	1.1	13	T	AUG. 8	1750	21	.06	25	T
APR. 3	1045	8	.25	42	T	SEP. 5	1515	18	1.3	12	T
05483600 MIDDLE RACCOON RIVER AT PANORA											
DEC. 6	1130	2	35	68	6.4	APR. 30	1530	21	54	63	9.2
JAN. 3	1045	0	14	250	9.4	JUNE 4	1210	31	31	54	4.5
FEB. 8	1800	0	13	20	.7	JULY 1	1700	23	335	900	810
MAR. 5	1230	1	40	8	.9	AUG. 5	1360	22	25	85	4.4
APR. 2	1030	7	28	42	3.2	SEP. 4	1420	21	390	2400	2530
FOX RIVER BASIN											
05494300 FOX RIVER NEAR BLOOMFIELD											
OCT. 17	0840	10	25	140	9.4						

B DAILY DISCHARGE.
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ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN WISCONSIN
 PERIODIC DETERMINATION OF SUSPENDED-SEDIMENT DISCHARGE, JULY 1967 TO OCTOBER 1968

DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	DATE	TIME	DIS- CHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
ROCK RIVER BASIN									
05433500 YELLOWSTONE RIVER NEAR BLANCHARDVILLE (LAT 42 46 55 LONG 089 59 50)									
AUG. 1, 1968	1340	8.9	48	1	AUG. 21, 1968	1415	9.1	2.0	T
AUG. 2	1145	8.4	23	1	AUG. 22	1500	8.4	18	T
AUG. 3	1125	8.1	32	1	AUG. 23	1540	8.1	33	1
AUG. 4	1100	8.1	22	T	AUG. 24	1515	7.8	44	1
AUG. 5	1130	10	38	1	AUG. 25	1510	7.6	28	1
AUG. 6	1130	8.4	34	1	AUG. 26	1300	7.6	37	1
AUG. 7	1400	12	34	1	AUG. 27	1435	7.3	30	1
AUG. 8	1305	13	40	1	AUG. 28	1500	7.6	26	1
AUG. 9	1305	10	46	1	AUG. 29	1430	7.3	26	1
AUG. 10	1300	10	43	1	AUG. 30	1415	7.3	41	1
AUG. 11	1300	8.9	30	1	AUG. 31	1450	7.3	90	2
AUG. 12	1300	8.4	34	1	SEP. 4	1445	7.8	130	3
AUG. 13	1300	8.4	21	T	SEP. 12	0820	14	36	1
AUG. 14	1500	7.8	17	T	SEP. 18	1125	58	109	17
AUG. 15	1440	8.1	24	1	SEP. 18	1630	32	58	5
AUG. 16	1350	8.4	23	1	SEP. 25	1125	43	7	1
AUG. 17	1400	8.1	17	T	OCT. 2	1100	12	10	1
AUG. 18	1405	7.8	26	1	OCT. 9	1430	12	34	1
AUG. 19	1315	8.1	23	1	OCT. 16	1600	11	18	1
AUG. 20	1415	19	101	5					

ILLINOIS RIVER BASIN

05543830 FOX RIVER AT WAUKESHA (LAT 43 00 17 LONG 088 14 37)									
MAY 9, 1968	1505	55	20	3	AUG. 20, 1968	1155	161	122	53
JUNE 20	1440	85	18	4	SEP. 30	1245	6.9	2	T
JULY 16	1230	52	6	1					

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ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN MISSOURI

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CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	DIS-CHARGE (CFS)	SILICA (SIO2)	IRON (FE)	MAN-GANESE (MN)	CALCIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLO-RIDE (CL)	FLUO-RIDE (F)	NI-TRATE (NO3)	TOTAL PHOS-PHORUS (PO4)
FABIUS RIVER BASIN															
05498800 SOUTH FABIUS RIVER AT NEWARK (LAT 39 59 07 LONG 091 58 26)															
MAR. 6	22	6.8	.19	.50	68	16	20	2.8	216	0	86	7.3	.1	.1	.04
05500000 SOUTH FABIUS RIVER NEAR TAYLOR (LAT 39 53 50 LONG 091 34 50)															
MAR. 7	36	7.9	.23	.51	74	16	18	3.0	233	0	83	7.5	.1	.4	.02
NORTH RIVER BASIN															
05500500 NORTH RIVER AT BETHEL (LAT 39 52 29 LONG 092 01 26)															
MAR. 6	2.7	11	.57	1.0	77	20	32	3.9	238	0	120	12	.2	1.6	.02
05501000 NORTH RIVER AT PALMYRA (LAT 39 49 05 LONG 091 31 15)															
MAR. 7	28	6.8	.30	.92	77	15	15	2.7	236	0	74	10	.1	.5	.04
PERUQUE CREEK BASIN															
05514700 PERUQUE CREEK NEAR O'FALLON (LAT 38 50 30 LONG 090 42 01)															
DEC. 13	70	14	.38	.12	44	8.6	11	3.4	141	0	36	11	.1	.3	.09
DARDENNE CREEK BASIN															
05514730 DARDENNE CREEK NEAR WELDON SPRING (LAT 38 44 26 LONG 090 41 43)															
DEC. 13	73	12	.34	.13	34	6.2	7.0	2.9	113	0	23	5.2	.2	.9	.12
DATE	AMMONIA NITRO-GEN (N)	ORGANIC NITRO-GEN (N)	METHY-LENE BLUE ACTIVE SUB-STANCE	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C)	HARD-NESS (CA, MG)	NON-CAR-BONATE NESS	SPECI-FIC CON-DUCTANCE (MICRO-MHOS)	PH	COLOR	CHEM-ICAL OXYGEN DEMAND	DIS-SOLVED OXYGEN	PER-CENT SATU-RATION	TUR-BID-ITY	TEM-PER-ATURE (DEG C)	
FABIUS RIVER BASIN															
05498800 SOUTH FABIUS RIVER AT NEWARK (LAT 39 59 07 LONG 091 58 26)															
MAR. 6	.00	.44	.04	324	236	58	514	7.8	5	9.9	15.0	119	4	6	
05500000 SOUTH FABIUS RIVER NEAR TAYLOR (LAT 39 53 50 LONG 091 34 50)															
MAR. 7	.08	.58	.02	336	251	60	534	7.7	5	4.9	13.1	100	6	4	
NORTH RIVER BASIN															
05500500 NORTH RIVER AT BETHEL (LAT 39 52 29 LONG 092 01 26)															
MAR. 6	.08	.46	.06	405	274	79	635	7.7	5	13	13.2	106	5	6	
05501000 NORTH RIVER AT PALMYRA (LAT 39 49 05 LONG 091 31 15)															
MAR. 7	.19	.66	.02	329	254	60	531	7.7	3	7.8	11.0	87	3.0	6	
PERUQUE CREEK BASIN															
05514700 PERUQUE CREEK NEAR O'FALLON (LAT 38 50 30 LONG 090 42 01)															
DEC. 13	.03	.46	.05	215	146	30	337	7.3	7	13	10.4	84	22	6	
DARDENNE CREEK BASIN															
05514730 DARDENNE CREEK NEAR WELDON SPRING (LAT 38 44 26 LONG 090 41 43)															
DEC. 13	.05	1.2	.05	164	111	18	255	7.3	7	8.1	11.2	90	8.0	6	

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES IN INDIANA

PERIODIC DETERMINATIONS OF SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)	DATE OF COLLECTION	TIME	WATER DISCHARGE (CFS)	SEDIMENT CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS PER DAY)
ILLINOIS RIVER BASIN									
05518000 KANKAKEE RIVER AT SHELBY (LAT 41 10 58 LONG 087 20 33)									
Oct. 18, 1967	1115	975	14	37	Mar. 4, 1968	1520	1820	100	491
Nov. 13.....	1630	1550	72	301	Apr. 2.....	1015	2240	54	327
Dec. 12.....	1530	2230	181	1090	May 29.....	1040	1670	75	338
05524500 IROQUOIS RIVER NEAR FORESMAN (LAT 40 52 14 LONG 087 18 24)									
July 10, 1968	1110	296	87	70	Aug. 28....	0915	82	134	30
July 10.....	1210	296	86	69					

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